

College and University Environmental Management System Guide



DRAFT

October 2001

EMS GUIDE FOR COLLEGES AND UNIVERSITIES

EXECUTIVE SUMMARY

There are significant reasons to implement an EMS at a college or university. Colleges and Universities (C/Us) are analogues of small cities encompassing myriad activities within their campus borders. These activities are as diverse as the operation of research laboratories, auto repair facilities, power plants, wastewater treatment plants, hazardous waste and trash disposal facilities, asbestos management, drinking water supply, agricultural research, grounds maintenance and incineration, to name just a few. Thus, C/Us must grapple with a wide range of environmental, health and safety issues to protect their communities and comply with the law. However, unlike the typical governmental unit, most C/Us have no central authority coordinating environmental practices. For this reason, many C/Us' internal environmental practices differ from department to department. An EMS, if implemented properly, can improve communications, establish responsibilities, training, and methods to address environmental issues and achieve the campuses environmental goals.

The EMS Guide for Colleges and Universities

EPA New England has for several years pioneered an Integrated Strategy, combining enforcement with the provision of compliance assistance to New England colleges and universities. As part of this Integrated Strategy, EPA New England has been working with C/Us to implement tools that help ensure compliance while encouraging the creation of more environmentally sustainable campuses.

One such tool that was created as part of the C/U Integrated Strategy is The Environmental Management System (EMS) Guide for Colleges and Universities. EPA New England and C/Us nationwide worked cooperatively to develop an EMS guide specifically tailored to C/Us' activities. Our goal is a guide that helps C/Us design a cost-effective EMS that improves compliance and environmental performance, promotes P2 and saves money. The EMS Guide will provide C/Us a framework to systematically identify, prioritize, manage, mitigate, and document the environmental aspects and impacts of its activities. This Guide provides procedures that should be used as guidelines to help you implement an EMS at your facility. It is not a stand-alone document or a boiler-plate EMS template. The procedures should be tailored to meet the specific needs and uniqueness of your C/U.

What is an EMS?

- A defined and integrated system of communication, established training, responsibilities, and methods to address environmental issues and achieve environmental goals.
- The part of an overall management system that includes organizational structure, planning activities, responsibilities, practices procedures, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy.

Designing and implementing a successful EMS can be challenging. It takes a fair amount of resources — manpower, money and time. However, based on previous EPA EMS pilot programs, many facilities undertaking an EMS discover that they have 85% of the EMS already in place. All that is needed is a system to tie it all together. In order to determine the extent and focus of the EMS, C/Us should assess current environmental management practices that can “evolve” into formal EMS elements and identify any missing EMS elements. It is also important for C/Us to determine the scope or the “fenceline” for their EMS. For your particular C/U, you may find it easier to implement an EMS in a selected department (or activity) and then expand the EMS to include other departments or the entire campus.

This Guide also provides useful information to help C/Us comply with some basic environmental regulatory requirements. This Guide, however, does not list all applicable regulatory requirements that might apply to your facility. Use this Guide as a starting point to determine what regulations may apply to your institution’s activities.

EPA New England’s EMS Pilot Program for C/Us

With the development of the EMS Guide for C/Us completed, the University of Massachusetts - Lowell EMS Service Program, through an EPA grant, and Triumvirate Environmental, are launching the EMS Pilot Program. The EMS Pilot Program is a voluntary training program designed to assist C/Us in implementing an EMS utilizing the EMS Guide. The EMS Pilot Program will work with a select group of colleges and universities who have made the commitment to EMS development and wish to benefit from a collaborative effort to implement an EMS in their schools. C/Us selected for the EMS Pilot Program will complete a series of training workshops supported by on-site technical assistance.

The EMS pilot program will begin in late 2001 and continue for an 18-24 month period at which time the participants should have a complete EMS in place. Participants will hopefully realize a variety of benefits as a result of their participation including, but not limited to: (1) better understanding of the root causes of noncompliance, (2) increased faculty and staff awareness of environmental issues, (3) lower costs through reduced energy use, and (4) better faculty and staff morale.

EMS GUIDE FOR COLLEGES AND UNIVERSITIES

INTRODUCTION

An environmental management system (EMS) is a framework for understanding an organization's "environmental footprint," complying with environmental regulations, and implementing proactive pollution prevention strategies. An EMS is not a checklist completed once a year to review compliance, a one-time project, or jargon for a policy statement. Rather, an EMS invokes a continual cycle of planning, doing, reviewing, and improving the processes and actions associated with the organization's responsible environmental management. A college or university (C/U) that invests in an EMS can realize an array of benefits to justify EMS "construction costs". Examples of these benefits and quotes from C/U personnel that are implementing an EMS are provided below.

"At Boston University, our management system successfully integrates environmental programs with health and safety. The foundation of our system is an "EHS Policy Manual" with 24 short, plain-English policies that serve as a practical guide to the entire community"

Peter Schneider, Director,
Office of EH&S, Boston University

"An EMS can serve as a blueprint for colleges and universities to plan, direct and facilitate their environmental programs. The EMS should provide an encompassing view of the necessary considerations in the college's management of environmental affairs."

Alan Cantara, EH&S Manager,
Rhode Island School of Design

"An EMS has provided a means of empowering all students, staff and faculty to participate in UMass Lowell's environmental program and commitment to sustainability."

Rich Lemoine, EH&S Manager,
University of Massachusetts Lowell

EMS Potential Benefits for C/Us

- ☑ Improve and achieve consistent compliance
- ☑ Avoid fines and expensive corrective actions due to compliance violations
- ☑ Lower day-to-day impacts on the environment
- ☑ Complements and informs academic curriculum with up-to-date industry tools
- ☑ Reduce environmental management and operating costs
- ☑ Improve working and living conditions for students, faculty, and employees
- ☑ Improve relations with government agencies
- ☑ Enhance image and reputation
- ☑ Maintain positive community relations
- ☑ Quantify environmental performance and document trends
- ☑ Eligibility for EPA Performance Track

The U.S. Environmental Protection Agency (EPA) Region 1 created this C/U EMS Guide to help C/Us design and implement an EMS in a streamlined, cost-effective manner. This introduction provides (1) an overview of the Guide content and organization and (2) a road map for getting started.

Additionally, EPA would like to acknowledge the following C/Us for providing input to the Guide and review of drafts:

- ♦ Boston College: http://www.bc.edu/bc_org/fvp/ehs/ (Suzanne Howard, former EHS Director)
- ♦ Boston University: <http://www.bu.edu/ehs/programs/manual.pdf> (Peter Schneider)
- ♦ Campus Consortium for Environmental Excellence (C2E2): <http://esf.uvm.edu/c2e2>
- ♦ Cape Cod Community College: <http://www.capecod.mass.edu/> (Bob Cleghorn)
- ♦ University of Colorado: <http://colorado.edu/ecenter> (Dave Wergin)
- ♦ University of Maine: <http://www.ume.maine.edu/~ehs/> (James Patrick)
- ♦ University of South Carolina: <http://ehs.sc.edu> (Phil Barnes, Trish Verman)
- ♦ University of Vermont: <http://www.esf.uvm.edu/> (Ralph Stuart)
- ♦ Westfield State College: <http://www.wsc.mass.edu> (Mindy Sullivan)
- ♦ Yale University: <http://www.yale.edu/oehs/> (Elan Gandsman)

In preparing this Guide, EPA has used examples from a particularly useful document titled Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations (Second Edition, January 2001) prepared by NSF International (<http://www.nsf-isr.org/>). Excerpts are cited where appropriate and typically are found in supporting elements where EMS implementation is similar for most organizations regardless of size or purpose.

C/U EMS GUIDE ORGANIZATION

This Implementation Guide consists of four modules as follows:

Module 1:	Policy	Module 3:	Implementation
Module 2:	Planning	Module 4:	Review and Improvement

Each module consists of one or more elements that comprise a C/U's EMS. Each element has the following structure:

- ♦ Brief overview of element subject, instructions, and references (less than 2 pages)
- ♦ Procedure for implementing element (less than 1 page)
- ♦ Tools and examples to assist element implementation (1 to 5 pages)

Procedures included for each element are included as suggested guides only and should be tailored to meet a C/U's needs. For example, features like frequency of review, titles, and responsibilities should be determined by the EMS Team. Specific EMS Guide elements and the manner in which they are organized are shown in the following table:

C/U-EMS GUIDE ELEMENTS

Number	Element
Module 1: Policy	
1.1	Environmental Policy
Module 2: Planning	
2.1	Environmental Aspects and Impacts
2.2	Compliance
2.3	Objectives and Targets
2.4	Operational Controls
Module 3: Implementation	
3.1	Roles and Responsibility
3.2	Communications
3.3	Training
3.4	EMS Document Control
3.5	Emergency Response and Preparedness
Module 4: Review and Improvement	
4.1	Measurement and Monitoring
4.2	EMS Nonconformance and Corrective Action
4.3	Corrective and Preventive Action for Compliance
4.4	Records
4.5	EMS Audits
4.6	Administration Review

Nomenclature and concepts for each element were generally derived from the International Standard for Environmental Management Systems, ISO 14001; however, the Guide does not strictly adhere to all aspects of ISO 14001. In particular, the Guide focuses on (1) creating a policy, (2) understanding and prioritizing all environmental aspects, (3) establishing compliance objectives or source reduction for priority aspects, and (4) taking actions and measuring results for each objective. The Guide is not an EMS primer or general guidance document. Guide users should be familiar with basic EMS concepts or review one or more of the numerous existing general EMS reference documents. (See “Get Help!” at the end of this section.) A glossary of EMS terms is provided in Appendix B.

Who's Who in the EMS?

C/Us will have to establish roles and responsibilities for the persons charged with developing and implementing your C/Us EMS. Assigning roles and responsibilities during the EMS planning process ensures that: (1) everyone knows why implementing an EMS is good for the institution, (2) everyone knows what influence they will have and how it will affect their work load; and (3) not all tasks will fall on one person or department. Within the Guide there are many references to the EMS Manager. Anyone within your C/Us institution can assume this role as long as they have sufficient knowledge of EMSs and understand the level and extent of the tasks which will be

required to implement the EMS. This position can be filled by a faculty member, the facilities director, or the EHS director.

Terms used throughout the Guide that are important to understanding EMS roles and responsibilities are:

- ◆ **EMS Manager:** C/U employee appointed by, and with the support of the C/U administration, is responsible for initiating and leading EMS implementation. This person may direct the department responsible for environmental matters or may report to the individual charged with such responsibility.”
- ◆ **EMS Team:** Core group of people comprised of C/U staff (e.g., facilities, maintenance), faculty, students, department heads, and administrators responsible for day-to-day EMS activities. Consider representation from students, purchasing, legal department and alumni affairs. While C/U environmental, health, and safety staff may lead the EMS initiatives, broad representation is critical to EMS success.
- ◆ **EMS Participants:** Anyone involved with implementation of EMS elements, including aspect and impact identification, compliance review, achieving objectives and targets, and collecting measurement and monitoring data
- ◆ **EMS Steering Group:** Small group of EMS Participants and C/U administrators providing (1) direction with respect to the breadth and direction of the EMS and (2) feedback via administration review to the EMS Team to ensure progress, effectiveness, and wise use of EMS resources.

KEY EMS CONCEPTS FOR YOUR C/U

Every C/U undertaking an EMS will have unique circumstances that dictate the extent, sequence and focus of its EMS. Some of the key EMS concepts that a C/U should consider during the planning process include:

- **Conduct A Preliminary Review Or Gap Analysis.**

A gap analysis should be performed to identify: (1) current environmental management practices that can "evolve" into EMS elements and (2) missing EMS elements. One tool that can be used is the Campus Consortium for Environmental Excellence (C2E2) EMS Self-Assessment Checklist (see the “Get Help” bullet on page 6 of this Introduction) to perform the gap analysis for your institution. A “crosswalk” between the C2E2 EMS Scorecard and the Guide is included at the end of this introduction. This crosswalk will help you identify the specific Guide elements that can fill gaps in your EMS.

In addition to the gap analysis, consider benchmarking your EMS plans by contacting other C/Us. (See C/U list on page 2 of this introduction.)

- **Determine the Scope for the EMS**

After completing a gap analysis, the EMS team should step back and make decisions regarding the scope of the EMS and how best to implement the initiative. Specifically, the EMS Team should consider issues such as:

- ◆ Should the EMS cover both environment and health and safety issues?

- ◆ How pertinent is the ISO 14001 EMS model to our C/U?
- ◆ Do we need to tackle the whole C/U at once or build momentum with selected departments and activities before expanding?
- **Communicate the EMS Initiative to Faculty, Students, and Staff and Invite Input.**
Faculty, students, and staff should be aware of the EMS implementation effort, its purpose and elements, and how individually, they contribute to achieving environmental performance objectives.
- **Obtain Top-Level Commitment.**
An EMS without commitment from the highest level of the administration, such as the President or Chancellor, Provosts, or department heads, is like a car without a driver – it will not run. Successful EMSs are characterized by top-level commitment demonstrated through words and actions.
- **Identify An EMS Manager Responsible for Coordinating EMS Efforts.**
Your C/Us administration should identify a person who will be responsible for initiating and leading EMS implementation -- the EMS Manager. The EMS Manager in turn should form an EMS Team including other personnel familiar with the institution's operations, material use, and waste management. At least one person on the EMS Team should have good spreadsheet skills (for example, Microsoft Excel), which will streamline charting of key EMS performance metrics.
- **Identify and Discuss Important EMS Features.**
EMSs are as unique as the C/Us that create and implement them. The EMS Team should meet to identify and discuss important EMS features that will guide the creation and implementation efforts. Several examples are provided below.
 - ◆ *Continual Improvement.* An EMS should feature continual improvement through "plan-do-check-act" strategies that lead to more efficient EMS implementation and better environmental performance.
 - ◆ *Compliance.* An EMS should, at a minimum, incorporate a systematic approach to maintaining compliance. For C/Us with prior regulatory issues, compliance may be of primary concern within the EMS. In any case, C/Us should strive to move towards exceeding compliance obligations.
 - ◆ *Emphasis on Pollution Prevention.* When developing options for achieving objectives and targets, action plans that prevent pollution through source reduction should be favored.
 - ◆ *Results-Oriented.* Although C/Us will create documentation during EMS implementation, the focus of the EMS should be on achieving results, that is, measurable or demonstrable environmental performance improvements.

- **Begin Implementing Guide Elements**

The key EMS concepts previously noted lay the foundation for actions to construct the EMS. This C/U EMS Guide contains the minimum elements needed for a functioning EMS. Creating and implementing an EMS is a challenging endeavor. Although some C/Us may choose to implement all elements of this Guide as part of a single effort, experience implementing EMSs at other types of organizations suggests that momentum can be gained by implementing the following elements first:

EMS elements to consider implementing first:

- ◆ Element 1.1 Environmental Policy
- ◆ Element 2.1 Environmental Aspects and Impacts
- ◆ Element 2.2 Compliance
- ◆ Element 2.3 Objectives and Targets
- ◆ Element 3.1 Roles and Responsibilities
- ◆ Element 3.2 Communication
- ◆ Element 3.3 Training
- ◆ Element 4.1 Measurement and Monitoring

How long will an EMS take?

That depends. The timeframe for developing and fully implementing an EMS will vary from C/U to CU and can be affected by such things as EMS scope, fluctuating resources and competing priorities. Realistically, initial EMS planning and development can take 6-9 months. Additionally, it may take 12 -18 months for your C/Us EMS to be fully implemented. The implementation tips presented below should get your C/Us EMS implementation efforts off to an efficient start.

EMS Implementation Tips:

- **Avoid "reinventing" procedures for the EMS.** Leverage components of other management systems and programs; for example, adapt existing training programs to include environmental training or model EMS documentation and document control procedures on document control used for other C/U operations.
- **Address priority areas first.** Although seemingly obvious, EMSs often stall after the organization expends a significant amount of effort cataloguing all its numerous environmental aspects. Instead, selecting a few top priority aspects and creating and executing action plans mitigating those aspects will achieve results quicker and build momentum that will lay the groundwork for a sustainable EMS.
- **Set reasonable goals.** Develop goals that are "do-able" within 12 months and make sure that several are achievable within 6 months; build momentum for your C/U's EMS and avoid setting over ambitious goals that may frustrate or stall EMS Participants.

- **Communicate!** Communication cannot be overemphasized: publicize efforts, trumpet successes, build support, and keep administrators involved.
- **Get help!** C/U-specific and general EMS assistance can be obtained from a variety of organizations and documents. Web sites and additional information can be found in Appendix A.

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A GOOD STARTING POINT: C2E2 EMS SCORECARD – EMS GUIDE “CROSSWALK”

The Campus Consortium for Environmental Excellence (C2E2) is a not-for-profit organization comprised of twenty leading colleges and universities. Its mission is to support the continued improvement of environmental performance in higher education through environmental professional networking, information exchange, the development of professional resources and tools, and the advancement of innovative regulatory models. To help C/Us move their EMSs forward, the C2E2 has developed an EMS self-assessment tool (<http://esf.uvm.edu/c2e2>) designed to help a campus identify the strengths and weaknesses of its current EMS.

USING THE CROSSWALK

The C2E2 Scorecard is essentially an EMS gap analysis and as such consists of a series of questions to identify the extent to which your EMS conforms to the generally agreed upon elements of a complete EMS.

To the right of the “Score” column, you will find a reference to where in the C/U EMS Guide, or which element, addresses the question. Consequently, the “crosswalk” links each C2E2 question to an appropriate part of the Guide, making it easy to find help in areas where you most need assistance.

A Word of Caution:

The “crosswalk” is based on C2E2 tool that contains terminology and concepts central to EMSs. If they are unfamiliar to your EMS Team, begin with some EMS awareness training that could include a review of the resources listed in this Introduction.

C2E2 SCORING

Score	Criteria
0	No process or program in place
1	A process (such as an undocumented procedure) exists but because it is unwritten or limited in scope, it is not fully adequate or effective.
2	The process generally works well or a procedure has been articulated, but is not comprehensive or integrated.
3	An appropriately comprehensive and integrated procedure exists.

Enter your score in the space provided, and make note of any comments or observations such as what information you used to answer the question, any actions to be taken to improve the situation or a score, or challenges in developing a procedure.

This scorecard contains a total of 33 questions in five different sections. It is important to acknowledge that the scores are designed to be useful as tools not grades per se. Because there are an unequal number of questions in each “section,” the total score may be skewed by a strength or weakness in a particular section. In order to evaluate scores across the sections, some users may wish to “normalize” scores by assuming each section is worth 20 percent of the total and developing a normalizing factor for each section.

A "perfect score" of "99" (for example, every question received a score of 3) would, if responded to thoroughly and honestly, indicate that the organization has all of the requisite EMS elements and procedures for an effective "state of the art" EMS. More likely, you will find that scores vary substantially across and within sections.

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C2E2 EMS Scorecard – EMS Guide Crosswalk

(Based on C2E2 EMS Self-Assessment Checklist)

C/U Department or Organization: _____

Review Conducted By: _____

Date Performed: _____

EMS ELEMENT		SCORE	C/U-EMS TEMPLATE ELEMENT
1.0 POLICY			
1.1	Is the environmental policy defined and endorsed by top management?		1.1
1.2	Does the environmental policy address environmental impacts relevant to an institution of higher education?		
1.3	Does the environmental policy include commitments to the improvement of its environmental performance?		1.1
1.4	Does the environmental policy include a commitment to comply with relevant environmental laws and regulations, and other requirements or obligations to which the institution has agreed?		1.1
1.5	Does the environmental policy provide a framework for setting and reviewing environmental objectives and targets?		
1.6	Is the environmental policy implemented, maintained and communicated to faculty, staff and students?		3.2
1.7	Is the environmental policy publicly available?		3.2
Subtotal (total maximum points = 21)			
2.0 PLANNING			
2.1	Is there a procedure to identify significant environmental impacts?		2.1, 2.3
2.2	Are significant impacts considered in setting environmental objectives?		2.1, 2.3
2.3	Is there a procedure to identify, access, and update environmental legal requirements?		2.2
2.4	Are environmental objectives and targets systematically established, reviewed, and documented?		2.3
Subtotal (total maximum points = 12)			
3.0 IMPLEMENTATION AND OPERATIONS			
3.1	Are roles, responsibilities, and authorities defined, documented, and communicated?		3.1
3.2	Does management provide the resources essential to the implementation and control of the EMS?		
3.3	Have all training needs been identified?		3.3

EMS ELEMENT		SCORE	C/U-EMS TEMPLATE ELEMENT
3.4	Are faculty, staff, and students competent to fulfill their roles under the EMS?		3.3
3.5	Are appropriate procedures established for internal communications to faculty, staff, and students?		3.2
3.6	Are appropriate procedures established for external communications regarding the EMS?		3.2
3.7	Is there documentation describing the EMS?		
3.8	Are proper document control procedures established?		3.4
3.9	Are all documents in a proper state and format?		3.4
3.10	Are operations and activities associated with significant environmental impacts effectively managed?		
3.11	Are procedures established and implemented for operations and activities identified as having the potential to cause significant harm to human health and the environment?		
3.12	Are procedures established to identify potential accidents and emergency situations?		3.5
3.13	Are procedures established to respond to accidents and emergency situations?		3.5
3.14	Are such procedures periodically tested and reviewed/revised after tests or after actual incidents?		
Subtotal (total maximum points = 42)			
4.0 CHECKING AND CORRECTIVE ACTION			
4.1	Is information systematically collected that is pertinent to the evaluation of programmatic and functional aspects of the EMS?		4.1
4.2	Are records appropriately retained?		4.4
4.3	Are processes in place where support the collection of information to determine compliance with applicable environmental laws and regulations?		2.2, 4.1
4.4	Is collected information analyzed to identify deficiencies and areas of concern?		
4.5	Are corrective actions developed to prevent future issues, in addition to correcting the immediate problem?		4.3
4.6	Are recommended and/or required corrective actions verified for implementation and evaluated for effectiveness?		
4.7	Is the checking and corrective action program evaluated for effectiveness?		
Subtotal (total maximum points = 21)			

EMS ELEMENT		SCORE	C/U-EMS TEMPLATE ELEMENT
5.0 ADMINISTRATION REVIEW			
5.1	Has top management reviewed the EMS?		4.6
TOTAL SCORE (33 questions and a total of 99 points)			

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ELEMENT 1.1

ENVIRONMENTAL POLICY

The intent of an environmental policy is to define the organization's commitment to the environment through continual improvement in environmental performance. A strong, clear environmental policy can serve as both a starting point for developing the EMS and a reference point for maintaining continual improvement. The policy should be evaluated regularly and modified, as necessary, to reflect changing environmental priorities.

At C/Us, the policy should function in two ways: (1) within the C/U (faculty, students, and administrative, operations, maintenance, physical plant, and faculty employees), the policy should focus attention on environmental issues associated with activities and services; and (2) outside the C/U (regulators and community) the policy is a public commitment to addressing environmental issues and continually improving environmental performance.

The environmental policy should, at minimum, address the following three topics:

- ◆ Commitment to compliance with applicable environmental legislation and regulations
- ◆ Pollution prevention
- ◆ Continual improvement

Although it is highly desirable to address each of these topics, circumstances and needs vary. There are many good policies (including some of the examples following) which do not address each of these items directly. Use the example policies provided as tools for this element to guide drafting of a policy that reflects the scope, intent, and commitment of your C/U.

Tips for Developing an Environmental Policy:

- 1. Incorporate Multiple Perspectives:** Develop a policy that reflects input from various perspectives; for example, chancellor/dean, department head, faculty, students, community members, and C/U staff (environmental, maintenance, operations, etc.).
- 2. Develop A "Marketing Plan:"** Include discussion of how to make people aware of your policy as part of the policy development effort. Make a list of groups and individuals to whom you want to distribute the policy and then match the media and method to the audience. Specifics of the policy dissemination should be described in Element 3.2, Communications. The policy should be easily available and translated into languages other than English, as appropriate.
- 3. Demonstrate C/U Administration Commitment:** The importance of top management commitment to the environmental policy cannot be overemphasized. It is the cornerstone of success for the EMS. Solicit input and commentary from your C/U administration and include their signatures on the policy to demonstrate understanding and commitment.

Environmental Policy Example #1

Tufts University's policy is succinct and far-reaching and identifies the both operational efficiency and awareness through education as keys to achieving its stated goal.

Tufts University

Tufts University Environmental Policy

We, the Tufts University community, affirm our belief that university faculty, staff and students have a responsibility to take a leadership role in conducting activities as responsible stewards of the physical environment and using educational activities to promote environmental awareness, local action and global thinking.

In our University function, Tufts University will strive to:

- conserve natural resources and support their sustainable use;
- conduct affairs in a manner that safeguards the environmental health and safety of students, faculty, staff and communities;
- reduce the use of toxic substances and the generation of wastes and promote strategies to reuse and recycle those wastes that cannot be avoided; and purchase renewable, reusable, recyclable and recycled materials.

In our education and research missions, Tufts University will strive to:

- foster an understanding of and a responsibility for the physical environment;
- ensure that individuals are knowledgeable about the environmental and health issues that affect their discipline;
- encourage environmental research;
- conduct research and teaching in an environmentally responsible way; and
- provide a forum for the open flow of information among government, international organizations, industry and academia to discuss and study environmental issues and their relationships to other social issues.

Environmental Policy Example #2

Brevard Community College's policy is a simple statement recognizing the potential for improvement and lists specific objectives supporting that initiative.

Brevard Community College

Policy Regarding Protection of the Environment

The Board of Trustees recognizes that the educational and responsible use of natural resources and protection of the environment is consistent with the standards of Brevard Community College and all its students and work family, and the Board recognizes a tremendous potential exists for improvement which is more in harmony with the ideas of the College. Therefore, Brevard Community College reaffirms these principles by adopting this policy related to sound environmental management and encourages all staff and students to be aware that:

- All buildings will be constructed with the utmost concern for their environmental impact
- The College will pursue a sound program for energy efficiency and conservation
- The college will ensure that proper handling and disposal be conducted for all hazardous waste materials
- The college will seek alternatives to products which are environmentally detrimental
- All faculty and staff are encouraged to implement and update periodically an awareness program of education in the conservation of energy, the recycling of materials and the handling of hazardous waste

Environmental Policy Example #3

University of Massachusetts Lowell's policy includes the three ISO 14000/1 precepts of continual improvement, pollution prevention, and compliance as well as a mnemonic for their top five priority within their environmental policy.

University of Massachusetts Lowell

Environmental Policy

January 2001

As a public institution of higher education, University of Massachusetts Lowell is committed to being a model of environmental health and safety in our teaching, in our research, in our partnerships with the community, and in the management of our own organization. The University challenges and empowers each employee and student to promote environmental leadership through our environmental principle, ***"Ride the CREST":***

- C:** Continuous Improvement
- R:** Reduce, Reuse, Recycle
- E:** Environmental Compliance
- S:** Stewardship
- T:** Training and Education

Continuous Improvement

...To enhance the environmental management system through checking, corrective action and annual top management review to achieve improvements in overall environmental performance.

Reduce, Reuse, Recycle

...To use processes, practices, materials or products that avoid or reduce pollution, which may include process changes, efficient use of resources, material substitution and recycling.

Environmental Compliance

...To meet and where practical exceed all relevant current environmental laws and regulations.

Stewardship

...To empower employees and students to identify significant environmental aspects of our activities, products, and services, and to implement programs with targets and objectives that protect the health and safety of people and the ecosystem.

Training and Education

...To provide appropriate training to all employees and students to ensure competence and awareness of our environmental policies and procedures, the significant environmental impacts of their work or activities, their roles and responsibilities in support of our environmental management system, and the potential consequences of departure from specified procedures.

ELEMENT 2.1

ENVIRONMENTAL ASPECTS AND IMPACTS

How does your C/U interact with the environment? The fundamental purpose of the EMS is to control and reduce the environmental impacts of your C/U's activities and procedures. For this reason, a critical element of the EMS involves identifying and prioritizing the environmental aspects and impacts associated with your school. Using the concept from the Introduction of your C/U's "environmental identifying aspects is akin to taking a picture of your "foot," while determining impacts is analogous to gauging the effect, or "footprint," of your step. **An environmental aspect is an element of an organization's activities, products, or services that can interact with the environment (ISO 14001 definition).** Aspects may have an **impact** defined as, "Any change to the environment...wholly or partially resulting from an organization's activities, products, or services," (ISO 14001 definition). Examples of C/U activities, aspects, and impacts are provided below.

In simplest terms:

Cause → Effect
|| ||
Aspect → Impact

Activity	Aspect	Impact
Food Service	<ul style="list-style-type: none">♦ Electricity Use♦ Water Use♦ Solid Waste♦ Food Waste	<ul style="list-style-type: none">♦ Air Pollution♦ Resource Consumption (water, energy, food)♦ Landfilling♦ Landfilling
Grounds Maintenance	<ul style="list-style-type: none">♦ Fuel Use♦ Pesticide/Fertilizer Use♦ Green Waste	<ul style="list-style-type: none">♦ Air Pollution♦ Pollutant Runoff♦ Compost

Assessing environmental aspects and impacts on a C/U campus can be particularly difficult. The complex organizational structure of the many C/U entities involved in the EMS can make the identification and prioritization of environmental aspects and impacts challenging. Furthermore, because C/Us operate like a small community, a wide variety of activities exist, each with its own set of aspects and impacts. While it is important to accurately identify environmental aspects and impacts, it can be easy to get caught up in the evaluation and delay progress of the EMS. There are many ways to complete an aspects and impacts review that are well documented elsewhere (see "EMS Resources" in Appendix A). This Implementation Guide focuses on getting your EMS started quickly to gain momentum, establishing a systematic approach that works for your C/U, and revisiting the aspects and impacts review later in a more far-

Procedure for Determining Criteria for Significant Aspects (Unofficial)

- ♦ Call everyone together and sit down
- ♦ Have coffee and donuts
- ♦ Brainstorm
- ♦ Listen, listen, listen
- ♦ Record

- Rich LeMoine
University of Massachusetts, Lowell

reaching manner. The following questions should be considered when identifying aspects and impacts:

IDENTIFYING ASPECTS	EVALUATING IMPACTS
<ul style="list-style-type: none"> Which activities and services interface with the environment in a way that could result (or has resulted) in environmental impacts? What materials, energy sources, and other resources are used in regular operations? What are the primary sources of emissions to the air, water, or land? What are the primary types of waste produced? What are the primary sources associated with each waste? Does the treatment or disposal of these wastes have potential environmental impacts? How does our land or infrastructure (such as buildings and campus grounds) interact with the environment? Which activities (for example, chemical or fuel storage) might lead to accidental releases? 	<ul style="list-style-type: none"> Are the impacts actual or potential? Are the impacts beneficial or damaging to the environment? What is the magnitude or degree of these impacts? What is the frequency or likelihood of these impacts? What is the duration and geographic area of these impacts? Which parts of the environment might be affected (for example, air, water, land, flora, or fauna)? Is the impact regulated in some manner? Have parties internal or external to the C/U expressed concerns about these impacts?

Source: Adapted from Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001

Once your C/U's environmental aspects and impacts have been identified, you face the challenge of evaluating and prioritizing each one. Because of the varied aspects and impacts found at a C/U, this process can be intimidating. **This Guide includes two steps to systematically identify, prioritize, and document aspects and impacts.** The first approach is designed to initiate general analysis of your C/U's aspects and impacts, while the second evaluates each aspect and impact for specific C/U activities in greater detail. Use the approaches in a way that works best for your organization. This process is particularly important because high-priority environmental aspects and impacts will be targeted when environmental objectives and targets are established.

Implementation: *Procedure 2.1, Environmental Aspects and Impacts*, describes how to identify and document your C/U's priorities. This Implementation Guide includes two steps in evaluating your C/U's aspects and impacts. A summary of the tools provided and an explanation of their use is provided below:

Environmental Aspects Assessment -- Form A: The first step uses detailed, structured matrices (Form A) to help catalogue and quantify environmental aspects associated with common C/U activities. At an EPA Region 1 C/U EMS conference in September 2000, the following four C/U activities were identified to be of greatest concern in a survey of C/U environmental health and safety personnel:

- ◆ Laboratories
- ◆ Janitorial Operations
- ◆ Fleet Operations

ENVIRONMENTAL ASPECTS AND IMPACTS WORKSHEET – FORM A

DEPARTMENT: _____ SUPERVISOR: _____

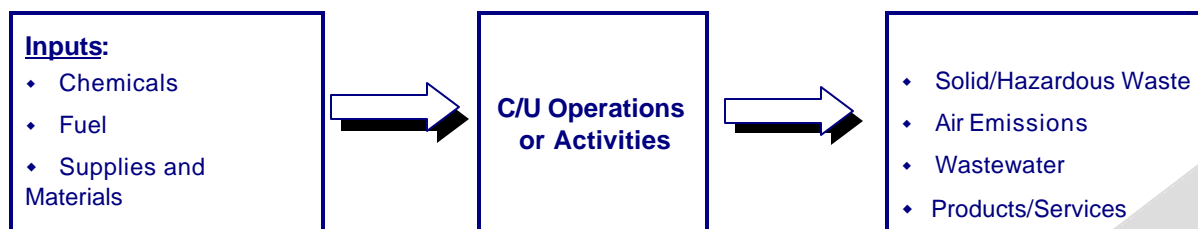
Activity	ENVIRONMENTAL ASPECT	IMPACT
•		
•		
•		
•		
•		
•		
•		

This Guide provides matrix tools for these four activities; however, your institution should evaluate others, as is appropriate for your C/U. Other C/U activities likely to have environmental aspects of significant concern identified in the same survey include:

- ✓ Printing
- ✓ Art Department
- ✓ Water Use
- ✓ Food Service and Campus Dining
- ✓ Buildings & Grounds Maintenance
- ✓ Hazardous Waste Management
- ✓ Construction, Renovation and Demolition
- ✓ Power/Steam Plan
- ✓ Computer and Information Systems
- ✓ Research and Development Facilities
- ✓ Wastewater Treatment
- ✓ Solid Waste Management
- ✓

Form A is generally organized around a C/U's activities and operations to incorporate a "system-by-system" analysis and prioritization across the entire C/U. A useful approach for tackling activities for which no Form A is included (see common activities listed above) is to identify and list the various inputs (resources) as well as related outputs (waste) from a given activity. This method simulates a "material balance" approach to encourage a holistic, rather than splintered, analysis.

Each environmental aspect and impact form is designed to document the source of each aspect, which should encourage you to consider source reduction (pollution prevention) strategies for mitigating the aspect and its impact.



Form A can help your EMS Team evaluate and document environmental aspects and impacts, enabling your team to objectively compare the environmental affects of C/U operations.

Environmental Aspects and Impacts Ranking - Form B – Form B should be used to compile the more detailed analysis from Form A, and (1) identifies the impacts associated with the aspects identified in Form A and (2) prioritizes the aspects and impacts relative to each other.

ENVIRONMENTAL ASPECTS ASSESSMENT SUMMARY - FORM B
ENVIRONMENTAL ASPECTS AND IMPACTS RANKING

For each aspect and impact, score each prioritization criterion on a scale from 1 to 5. For Impact criteria, 5 indicates the criterion is very important or relevant to that aspect (for example, the aspect is strictly regulated, is the subject of compliance violations, or highly hazardous), and 1 indicates the criterion is relatively unimportant. For Cost/Feasibility criteria, "5" indicates an aspect which is relatively easy to manage and "1" indicates one which is difficult or expensive to manage.

Aspect	Impact	Sources	Prioritization						Score (Sum of scores)	
			Impact Magnitude 5 = High 1 = Low					Cost/Feasibility 5 = High 1 = Low		
			Regulatory compliance	Likelihood	Frequency	Environmental Consequence	Health consequence	Cost/Feasibility to Reduce Impact		
1.										
2.										
3.										

Before beginning this step, you should consider what ranking criteria you wish to use and customize the sample Environmental Aspects and Impacts Ranking form ("Form B") to include the criteria you have selected. Some ranking criteria you may wish to consider include:

- Regulatory Compliance Requirements
- Likelihood of Negative Impact Occurring
- Frequency of Negative Impact
- Environmental Consequence of Potential Impact
- Human Health Consequence of Potential Impact
- Business Cost of Impact
- Cost or Level of Effort to Reduce Negative Impact
- Potential for Fine or Penalty
- Potential for Harm to Public Image

Form B can be revisited regularly to update your aspects and impacts prioritization. The sample Form B includes several example criteria by which to prioritize your environmental aspects and impacts; one way to prioritize environmental aspects and impacts using Form B is as follows:

Step 1:

For each aspect and impact, score each prioritization criterion on a scale. For example for impact criteria, 5 indicates the criterion is very important or relevant to that aspect (for example, the aspect is strictly regulated, is the subject of compliance violations, or is highly hazardous to health or the environment), and 1 indicates the criterion is relatively unimportant. For Cost and Feasibility criteria, 5 should indicate an impact which is inexpensive or simple to fix and 1 should be used where the remedy is costly or complex.

Step 2:

Add the scores of all criteria for each aspect and write the total in the right-most column of the form. This number indicates the relative priority of the aspect compared to other aspects and impacts in the same category. The lower the total score, the higher the priority.

Step 3:

Use the prioritized list of aspects when setting Objectives and Targets in Element 2.3

For More Ideas on Identifying and Prioritizing Aspects and Impacts

There are many approaches to identifying and prioritizing Environmental Aspects and Impacts and the key is finding an approach that works for your organization. It is important to identify the most significant issues, but not to get bogged down in excessive detail. An Excellent source of alternative approaches to this task can be found in the discussion of Environmental Aspects in Section 4 of the EMS Guide for Small and Medium Sized Organizations. Appendix A to this document also includes a variety of sample forms and procedures taken from actual use.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

EMS Procedure	2.1
Effective Date	
[C/U Name]	Subject Environmental Aspects and Impacts

Purpose This procedure is used to identify, document, and update the environmental aspects and impacts of the [C/U Name] activities and services.

Step 1 The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for identifying and prioritizing the environmental aspects and impacts of [C/U Name] operations during EMS planning and development.

Environmental aspects are characteristics of [C/U Name] operations that interact with the environment. Only environmental aspects the [C/U Name] can control or influence will be considered.

Environmental impacts are the effects of a [C/U Name] activities or services on the environment.

Step 2 Environmental aspects and impacts will be documented and prioritized using Aspects Forms A and B and other methods, as listed below:

- _____
- _____
- _____

Additional environmental aspects relevant to the [C/U Name] operations will be evaluated as needed. High-priority environmental aspects and impacts will be considered when environmental objectives and targets are set.

Step 3 The EMS Manager and other EMS Participants will review and update the environmental aspects and impacts documentation annually.

Step 4 Environmental aspects and impacts documentation will be retained at the [C/U Name] for at least 2 years.

Responsible Person: _____

Signature and Date: _____

ENVIRONMENTAL ASPECTS AND IMPACTS WORKSHEET – FORM A

DEPARTMENT: _____

SUPERVISOR: _____

ACTIVITY	ENVIRONMENTAL ASPECT	IMPACT
▪		
▪		
▪		
▪		
▪		
▪		
▪		
▪		
▪		
▪		
▪		

Responsible Person

Effective Date

ENVIRONMENTAL ASPECTS AND IMPACTS WORKSHEET – FORM A

VEHICLE OPERATIONS EXAMPLE

ACTIVITY OR OPERATION	ENVIRONMENTAL ASPECT	IMPACT
VEHICLE USE	<input type="checkbox"/> Emissions (CO ₂ and NO _x) <input type="checkbox"/> Potential fluid spill <input type="checkbox"/> Energy usage	<input type="checkbox"/> Contaminants in air <input type="checkbox"/> Soil and water contamination <input type="checkbox"/> Natural resource depletion
OIL CHANGE	<input type="checkbox"/> Potential Spill	<input type="checkbox"/> Unsafe working conditions
FUEL STORAGE	<input type="checkbox"/> Potential Leak	<input type="checkbox"/> Soil and ground water contamination
BATTERY CHANGE/STORAGE	<input type="checkbox"/> Breakage of casing could result in spill	<input type="checkbox"/> Increased health risk with potential contamination
SOLVENT USE/STORAGE/REMOVAL	<input type="checkbox"/> Potential for accidental spillage <input type="checkbox"/> Exposure to toxics	<input type="checkbox"/> Increased health risk <input type="checkbox"/> Contamination to ground water
PAINTING VEHICLES <input checked="" type="checkbox"/> APPLICATION <input checked="" type="checkbox"/> PAINT DISPOSAL <input checked="" type="checkbox"/> PAINT STORAGE	<input type="checkbox"/> VOC emissions <input type="checkbox"/> Improper disposal <input type="checkbox"/> Improper storage	<input type="checkbox"/> Toxicity of contaminants in air <input type="checkbox"/> Increase toxicity of garbage <input type="checkbox"/> Increased health risk
USED OIL TRANSFER AND STORAGE	<input type="checkbox"/> Potential spill or leak	<input type="checkbox"/> Soil and ground water contamination
ABSORBENT RAG USE AND DISPOSAL	<input type="checkbox"/> Improper disposal	<input type="checkbox"/> Increase toxicity of garbage

Responsible Person

Effective Date

ENVIRONMENTAL ASPECTS ASSESSMENT SUMMARY - FORM B

ENVIRONMENTAL ASPECTS AND IMPACTS RANKING

For each aspect and impact, score each prioritization criterion on a scale from 1 to 5 For impact criteria, 5 indicates the criterion is very important or relevant to that aspect (for example, the aspect is strictly regulated, is the subject of compliance violations, or highly hazardous), and 1 indicates the criterion is relatively unimportant). For Cost/Feasibility criteria, "5" indicates an aspect which is relatively easy to manage and "1" indicates one which is difficult or expensive to manage.

			Prioritization						SCORE (a OF SCORES)
			Impact Magnitude 5+ High 1 = Low					Cost 1 = High 5 = Low	
Aspect	Impact	Sources	Regulatory compliance	Likelihood	Frequency	Environmental Consequence	Health consequence	Cost/ Feasibility to Reduce Impact	
1.									
2.									
3.									
4.									
5.									
6.									

Add Continuation Sheets as needed to Rank All Aspects.

ENVIRONMENTAL ASPECTS ASSESSMENT SUMMARY - FORM B

ENVIRONMENTAL ASPECTS AND IMPACTS RANKING

EXAMPLE

			Prioritization						SCORE (a OF SCORES)
			Impact Magnitude 5+ High 1= Low					Cost 1 = High 5 = Low	
Aspect	Impact	Sources	Regulatory compliance	Likelihood	Frequency	Environmental Consequence	Health consequence	Cost / Feasibility to Reduce Impact	
Energy Generation and Use	CO ₂ emissions	<ul style="list-style-type: none"> Primary sources included HVAC, lighting, & refrigeration 	5	5	5	4	1	3	23
2. Laboratory experimentation	Biological wastes	<ul style="list-style-type: none"> Medical school laboratories Animal science laboratories 	5	5	5	4	5	5	29
3. continue as appropriate to rank all aspects...									

COMPLIANCE

All EMSs must, at a minimum, address compliance with applicable environmental regulations. Because C/U activities create a diverse, often uncertain, hazardous waste stream, it is especially critical that C/U's develop and implement a structured, comprehensive approach to compliance. In March 1999, EPA New England announced its college and university initiative that includes proactive assistance tailored to the needs of C/Us as well as an aggressive enforcement presence, including unannounced inspections at university campuses. Several of the inspections have resulted in penalty actions. Since then, other EPA Regions launched similar initiatives. EPA's Office of Enforcement and Compliance Assistance (OECA) published the C/U enforcement initiatives at <http://es.epa.gov/oeca/ore/enfalert/vol3num7.html>. EPA's goal is to improve the environmental footprint at colleges and universities and set the same standards of private industry to ensure overall compliance. Costs of noncompliance can have significant effects both on and off campus, some of which include:

What is Compliance Review?

A compliance review is a periodic assessment of your C/Us compliance with environmental legal requirements.

- **Penalties** – depending on the extent of regulatory violations, recent fines to C/U's have ranged from \$10,000 to over \$1,500,000. Additionally, costly fines may affect departmental funding, potentially affecting academic performance.
- **University Reputation** – C/U's compete for talent in the form of students and faculty and funding whether governmental or private, much as any private industry, and as environmental awareness increases among prospective students, their parents, and funding organizations, poor environmental performance may negatively impact enrollment and funding.
- **Community Relations** – C/U's operations can impact the environmental quality of their surrounding community, and for C/Us situated in smaller cities or rural areas, C/U's are often the financial and cultural center of the community and are therefore closely identified with the image of the community. Regulatory violations by C/U's not only affect the campus, but might also affect the image of neighboring communities.

To be in compliance with the laws and regulations that apply to your C/U and its operations, you must (1) *know what the regulations are* and (2) *implement procedures and install equipment to comply with those regulations*. Changes in compliance requirements might require you to modify your environmental objectives or other elements of your EMS. By anticipating new requirements, you may be able to minimize future compliance obligations through process changes. Therefore, it's important to (1) identify and use information and assistance sources such as guidance documents and technical contacts at pertinent regulating agencies, (2) maintain contact with local and national associations and workgroups, and (3) commit to reviewing your compliance requirements at regular time intervals during the year.

COMMONLY APPLICABLE FEDERAL ENVIRONMENTAL LAWS

Law	Description
Clean Air Act (CAA) [40 CFR Parts 50-99]	Establishes ambient and source emission standards and permit requirements for conventional and hazardous air pollutants. Ozone Deplete Chemicals (ODCs): Establishes reclamation, recovery, recycling, and disposal procedures of refrigerants from vehicle maintenance facilities and air conditioning units. Also establishes certification procedures for technicians and equipment.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as "Superfund") [40 CFR Parts 300-311]	Establishes a program for cleaning up contaminated waste sites and establishes liability for cleanup costs. Also, provides reporting requirements for releases of hazardous substances.
Clean Water Act (CWA) [40 CFR Parts 100-145, 220-232, 410-471]	Establishes ambient and point source effluent standards and permit requirements for water pollutants, including sources that discharge directly to a waterbody or to a public sewer system.
Emergency Planning and Community Right-To-Know Act (EPCRA) [40 CFR Parts 350-374]	Establishes a program (also known as the "Toxic Release Inventory") to inform the public about releases of hazardous and toxic chemicals. Reporting requirements apply to companies that use, process or store specific chemicals over specified quantities.
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) [40 CFR Parts 150-189]	Establishes a program for Federal review of, registration and control of pesticides.
Hazardous Materials Transportation Act (HMTA) [49 CFR Parts 100-180]	Establishes standards for the safe transportation of hazardous materials.
National Environmental Policy Act (NEPA) [40 CFR Part 6]	Establishes national environmental policies and goals.
Resource Conservation and Recovery Act (RCRA) [40 CFR Parts 240-299]	Establishes regulations and permit requirements for hazardous waste management. Also, creates standards for underground storage tanks that hold oil or hazardous substances.
Safe Drinking Water Act (SDWA) [40 CFR Part 141]	Sets minimum national standards for drinking water. Developed maximum contaminant levels for coliform bacteria and hazardous waste. Required that mechanisms be put in place to protect groundwater and that water supplies be periodically monitored.
Toxic Substance Control Act (TSCA) [40 CFR Part	<ul style="list-style-type: none"> Require manufacturers to submit reports from specified toxicity tests for EPA assessment. Identify new and existing substances that may pose a significant risk or injury to health or the environment because there is insufficient information to conclude that they do not pose a significant risk or injury.

Source: adapted from Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001

Also, as you complete the process of cataloging compliance requirements, you should begin to identify “environmental metrics” that should be addressed in *Element 4.1, Measurement and Monitoring*.

DRAFT

WHAT LAWS MAY APPLY TO YOUR C/U ACTIVITIES?¹

	CAA	CERCLA	CWA	EPCRA	FIFRA	HMTA	NEPA	RCRA	SWDA	TSCA
Laboratories	•		•			•		•		
Janitorial Services	•		•			•		•		
Art Studios	•		•			•		•		
Fleet Operations	•		•			•		•		•
Grounds Maintenance	•	•	•	•	•			•	•	
Power Generation	•		•	•			•	•	•	•
Water/Wastewater Treatment	•	•	•	•	•		•	•	•	•
Fuels Management	•		•			•	•	•	•	•
Solid Waste Management	•	•	•			•	•	•	•	
Hazardous Materials Management	•	•	•	•		•	•	•		
New Construction	•	•	•				•	•		
Renovation/Demolition	•		•				•	•		•
Building Maintenance	•	•	•	•	•		•	•		
Outdoor Recreation (stadiums, golf courses, etc.)	•	•	•	•	•		•	•		•
Food Services	•		•							

1 This matrix contains probable, but not comprehensive, lists of federal regulations pertinent to common C/U activities. Use the matrix as a starting point for determining your C/U's unique compliance obligations.

Implementation: *Procedure 2.2, Compliance*, describes the process for identifying and maintaining your C/U's regulatory compliance approach. Because C/Us across the country and even within the same state have widely varying compliance requirements that are often dictated at the state or local level (for example, RCRA authorized states that add additional hazardous wastes requirements), the tools included in this element focus on helping your C/U address common deficiencies with C/U compliance programs. The tools are described below:

Regulatory compliance requirements include:

- Federal requirements
- State and local requirements
- Permit conditions

Other environmental "requirements" might include:

- Talloires Declaration
- Copernicus Initiative
- Greenhouse Gas Reduction Commitments
- C/U-specific procedures and standards

Compliance Calendar (see page 2.2-9). The compliance calendar is a blank form for organizing compliance requirements according to the frequency of completing reporting requirements. Your C/U can use the compliance calendar to manage your resources and scheduling to anticipate the reporting obligations you have on daily, weekly, monthly, or annual basis, or on a specific date.

Common Deficiencies with C/U Compliance Programs (see page 2.2-11). These tools summarize areas in which EPA often discovers insufficient documentation or compliance with regulations; there are tools for the Resource Conservation Recovery Act (RCRA), Spill Prevention, Controls and Countermeasure (SPCC) Plans, underground storage tanks (UST), and the Clean Air Act (CAA).

In addition, several guides for Common Compliance Documentation issues are available at <http://www.epa.gov/region01/steward/univ/index.html> in case your C/U has no similar form already developed, or if the existing form needs improvement.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	2.2
	Effective Date	
	Subject	Compliance

- Purpose** This procedure is used to (1) ensure {C/U name} compliance with environmental legal requirements, (2) identify {C/U name} current compliance status and performance, and (3) and help the {C/U name} become informed about and track compliance requirements.
- Step 1** The EMS Manager will complete a structured regulatory compliance review of the [C/U Name] operations. The EMS Manager will select other EMS Participants and outside parties as appropriate to assist in the review. Generally, the compliance review will initially occur as a paper exercise conducted in the office and migrate to physical inspections and document review with individuals able to confirm and document the presence of appropriate compliance programs.
- Step 2** After completing the compliance review, the EMS manager will prepare a list of potential objectives and targets related to compliance requirements or performance. The list will be used in completing Element 2.3, Objectives and Targets.
- Step 3** The EMS manager will reference the results of the compliance review during day-to-day operations to assist in planning for and meeting the [C/U Name] compliance requirements.
- Step 4** The EMS manager will stay informed of changing environmental regulations by (check those that apply):
- ☐ Reviewing regulatory updates and its [C/U Name] compliance calendar
 - ☐ Attending compliance workshops offered by federal, state, and local regulatory agencies and [C/U Name] sector associations.
 - ☐ Using a consultant specializing in compliance issues
 - ☐ Visiting Internet websites with compliance assistance content
 - ☐ Other
- Step 5** The environmental manger or designee will periodically complete a compliance review to identify new and existing weaknesses, and in response to new or changed environmental regulations.

EMS Compliance Calendar

WEEKLY

Agency	Program	Program/ Question	Scheduled Task

MONTHLY

Agency	Program	Program/ Question	Scheduled Task

QUARTERLY

Agency	Program	Program/ Question	Scheduled Task

EMS Compliance Calendar

ANNUALLY

Agency	Program	Program/ Question	Scheduled Task

PERIODICALLY

Date	Agency	Program	Program/ Question	Scheduled Task

EMS Compliance Calendar (Example)

Compliance Calendar

WEEKLY

Agency	Program	Scheduled Task
State/Local	On-site Hazardous Waste Management	Facility Inspection -- check containment, stored containers, and tanks

MONTHLY

Agency	Program	Scheduled Task
State/Local	Storm Water Pollution Prevention	Facility Inspection – conduct storm water discharge visual observation – check for presence of floating and suspended material, oil and grease, discoloration, turbidity, odor, and pollutants
POTW	Industrial Wastewater Discharge	Periodic Sampling
State/Local	Fuel Storage and Management	Tank, dispensing equipment inspections

QUARTERLY

Agency	Program	Scheduled Task
State/Local	Storm Water Pollution Prevention	Facility Inspection – conduct non-storm water discharge visual observation – check for flow, debris, odor, and discoloration
POTW	Industrial Wastewater Discharge	Periodic Report of Continued Compliance – submit quarterly discharge monitoring report to local sewer agency.

EMS Compliance Calendar (Example)

ANNUALLY

Agency	Program	Scheduled Task
POTW	Industrial Wastewater Discharge	Industrial Discharge Permit – submit annual update (Note: update schedule may differ)
State/Local	On-site Hazardous Waste Management	Facility Inspection – check storage tank system
State/Local	Hazardous Materials	Submit annual update of Hazardous Materials Plan to local or state agency.
USEPA State/Local	Employee Training	Emergency Coordinator Training – annual refresher training
USEPA	RCRA	Annual Refresher Training
	TRI	Annual Toxic Release Inventory Reporting

PERIODICALLY

Date	Agency	Program	Scheduled Task
March 1 of Even Number Years	USEPA State/Local	On-site Hazardous Waste Management	Biennial Report – submit completed report on agency forms, if required
June 1	State/Local	Storm Water Pollution Prevention	Facility Inspection & Plan Review – conduct annual inspection of storm water structures and evaluation of SWPP Plan
Every 3 years	USEPA/ State	SPCC	SPCC Recertification and updating
Every 90 days	USEPA/ State/Local	Hazardous Waste Management	Dispose of any hazardous waste before 90-day limit

Common Deficiencies with C/U Compliance Programs

INSTRUCTIONS: Included in this tool, are lists of common deficiencies EPA encounters in enforcing federal regulations. The list includes only the most common violations and is intended to spur review of your C/U's status and not act as a comprehensive checklist; there are lists for:

Regulation	Description
RCRA	<ul style="list-style-type: none"> ✓ Failure to appropriately label and mark satellite accumulation containers. ✓ Failure to clearly mark and date the period of accumulation for each accumulation container. ✓ Failure to provide and document initial hazardous waste training. ✓ Failure to separate or protect containers of hazardous waste from other containers storing incompatible materials or wastes. ✓ Failure to make hazardous waste determinations. ✓ Failure to accumulate hazardous waste in a closed container except when adding or removing waste. ✓ Failure to obtain a permit when storing hazardous wastes for greater than 90 days. ✓ Failure to inspect hazardous waste containers, specifically failure to inspect on a weekly basis. ✓ Failure to have an adequate Contingency Plan for new operations. ✓ Failure to provide secondary containment around hazardous waste container storage areas in an area with a functional floor drain. ✓ Failure to maintain and operate the facility in a manner to minimize the possibility any planned or unplanned release of hazardous constituents to air, soil, or surface water which could threaten human health or the environment. ✓ Failure to maintain adequate aisle space to allow the unobstructed movement of personnel or emergency equipment in the container storage areas.
SPCC	<ul style="list-style-type: none"> ✓ No plan at all. ✓ Failure to prepare and implement SPCC plan, specifically failed to include all elements of a complete plan as required by SPCC regulations. ✓ Plan not PE certified. ✓ Plan not reviewed/updated every three years. ✓ Plan does not include all oil on facility, i.e., transformers, hydraulic systems, emergency generators, drum storage, etc. ✓ Plan does not accurately identify, from each oil storage location, the detailed path spilled oil would take to reach a waterway, i.e., a typical campus is so wide, drainage may flow in different directions, to different receptors, especially in urban locations. Drains not traced out. ✓ Designated staff do not conduct regular walk-through inspections of teaching and research locations to be aware of oil use by professors, TAs, graduate students, and other non-maintenance staff. ✓ Small, scattered Aboveground Storage Tanks (ASTs), especially in dormitory locations, are not adequately protected from tampering/vandalism. A transient student population presents unique hazards not encountered with supervised adults in an industrial setting. Students are not employees, are not OSHA trained, and have no stake in paycheck protection through preservation of an employer's image or goodwill.

Common Deficiencies with C/U Compliance Programs

CAA	<ul style="list-style-type: none"> ✓ Failure to submit appropriate reports. ✓ Failure to monitor fuel for nitrogen and sulfur content. ✓ Failure to obtain minor permits. ✓ Failure to install or failure to maintain in good working order opacity monitors. ✓ Exceeding annual or 12 month rolling cap for fuel or steam production. ✓ Failure to provide and document actual annual VOC emission calculations for solvent degreasers. Also involves records of solvent additions and deletions from degreaser. ✓ If there is a gasoline pump on site: <ul style="list-style-type: none"> ▪ Failure to keep monthly throughput records. ▪ Failure to install/test vapor recovery system; and ▪ Failure to keep records of maintenance and malfunctions of vapor recovery systems. ✓ If there is a paint booth, use of paint booth coatings that exceeded allowable limits of VOC contents. ✓ Failure to obtain permits and keep records of operating hours for emergency generators.
UST	<ul style="list-style-type: none"> ✓ Leak detection system not working properly for a gasoline tank. ✓ Several tanks have no leak detection system. ✓ Incomplete tank removal – the hole was left in ground along with the contaminated soil on site.

OBJECTIVES AND TARGETS

After you identify the C/U's environmental aspects and impacts and regulatory compliance requirements, objectives and targets should be developed for the significant, or highest priority, environmental aspects and compliance concerns. An **objective** is a facility or campus goal that is consistent with the C/U's environmental policy, priority environmental aspects and impacts, and applicable environmental regulations. A **target** is a more detailed performance goal related to and supporting a specific objective. In other words, specific targets must be met for an objective to be achieved.

Defining EMS objectives and targets on a regular basis is a central feature of an EMS that "works." In a sense, the entire EMS is an "engine" for achieving environmental goals (i.e., objectives and targets) that will lead to continual improvements in environmental performance (consistent compliance and source reduction).

EXAMPLES OF C/U OBJECTIVES AND TARGETS	
Objective	Target
Reduce hazardous waste generation from chemistry labs	<ul style="list-style-type: none">Decrease quarterly quantity of lab-pack hazardous waste by 15% by March 2002 compared to 2000 quarterly average
Purchase "greener" janitorial chemicals	<ul style="list-style-type: none">Replace three high-use products with alternatives safer for the environment, employees, and students by January 2002
Conserve energy in nonresidential campus buildings	<ul style="list-style-type: none">Decrease kWh use by 10% by January 2002 compared to 2000 same month use
Improve solid waste management	<ul style="list-style-type: none">Increase recycling diversion rate to 50 percent (including food waste) by January 2002
Improve hazardous waste compliance	<ul style="list-style-type: none">Add improved Hazardous Waste awareness module to initial and update training program for all employees and staff by January 2002Implement new online interactive Hazardous Waste training for all employees and staff who generate or manage Hazardous Waste by June 2002.Post Hazardous Waste Awareness posters on bulletin boards near all generation areas. By January 2002
Improve fuel storage compliance	<ul style="list-style-type: none">Develop standardized forms/reports and master schedule for all compliance obligations relating to each of the 27 fuel storage facilities

EXAMPLES OF C/U OBJECTIVES AND TARGETS	
Objective	Target
Improve C/U's environmental standing and image with the local community	<ul style="list-style-type: none"> Produce and make available C/U Annual Environmental Report via website; promote at least four accomplishments during 2001 through local press releases

EMS Objectives reflect priority aspects and compliance issues and targets should be:

- Manageable: Number and complexity of objectives and targets should be kept at a level that you feel you can successfully manage. (You can always add more later!)
- Linked to a source (of the waste or environmental aspect)
- Related to a baseline
- Quantitative (that is, measurable)
- Normalized (that is, scaled to the level of activity)

The objectives and targets represent the transition from planning to action. Many other EMS elements, particularly measurement and monitoring activities, will be driven by the objectives and targets. For this reason, they should be carefully expressed and energetically communicated to all C/U participants. In addition, endorsement from C/U administration and input from faculty, students, and staff affected by the objective is critical in developing targets that are meaningful and practical. Reviewing the objectives and targets at regular intervals provides a good

opportunity to gauge progress, cost savings, and improved environmental performance.

Simply stating EMS objectives and targets seldom initiates action. Therefore, **a reasonably detailed action plan should be prepared for each objective.** These action plans, sometimes referred to as "environmental management programs," should include details that address "who, how, and when," an objective will be reached. That is, the action plan should define responsibilities for particular actions, describe how the actions will be taken, and set deadlines for completing the actions.

Objectives and targets originate from:

- Environmental Policy
- Aspects and Impacts Review
- Compliance Review
- Corrective and Preventive Action

Identifying a production or activity metric that can be used to normalize data collected to measure progress is an essential part of developing an action plan. **Normalization** where appropriate is the only true method to gauge progress toward EMS targets because increases or decreases in activity can skew data collected under EMS measurement and monitoring. For example, if water conservation is an EMS objective and campus-wide water use is the parameter measured for the target, an increase in student enrollment might affect water use reduction efforts. Examples of normalization metrics that might be used at C/Us include:

- C/U-wide: Student enrollment (campus-wide or in particular classes and labs)
- Pesticide Use: Acres of grounds landscaped
- HVAC Energy Use or Janitorial Chemical Use: Square feet of building space maintained

- ♦ Vehicle Maintenance: Number of vehicles or miles traveled

Implementation: *Procedure 2.3, Objectives and Targets*, describes the process your C/U should follow to develop and update its environmental objectives and targets and associated action plans. Complete the EMS tools that support this procedure, including a summary table and action plans for each objective and target that facilitate and document the process of developing objectives, targets associated with those objectives, and parameters that will be measured to track progress made to meet the objective.

DRAFT

PROCEDURE 2.3

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	2.3
	Effective Date	
	Subject	Objectives and Targets

Purpose This procedure is used to (1) develop and update the EMS objectives and targets and (2) create action plans for achieving the objectives.

Step 1 The EMS Manager and EMS Participants are responsible for developing the EMS objectives and targets. Similar to the aspects and impacts review, the EMS Manager solicits input from [C/U Name] departmental staff to ensure that objectives and targets are realistic and achievable.

Objectives are goals that are consistent with the organization's environmental policy, priority environmental aspects, and applicable environmental regulations.

Targets are detailed performance goals related to, and supporting a specific objective. Targets should be quantitative, realistic, linked to a source, measurable, and related to a baseline and normalization metric.

Step 2 Objectives and targets will be linked to significant environmental aspects and compliance issues identified by EMS Procedures 2.1 and 2.2, respectively.

Step 3 An action plan will be developed for each objective. Each action plan will describe specific actions needed to achieve the objective, the resources needed for each action, the person responsible for each action, and deadlines.

Step 4 Progress in achieving EMS objectives and targets will be tracked according to procedures described in Element 4.1, Measurement and Monitoring.

Step 5 On a monthly basis, the EMS Manager and other [C/U Name] departmental and facility staff will (1) review objectives, (2) discuss the impact of corrective and preventive actions on objectives and targets, (3) determine whether existing objectives should be modified based on experience from the action plan and (4) develop new EMS objectives when existing objectives are met.

Step 6 Every 6 months, the EMS Manager will prepare a status report of progress against objectives and targets for the [C/U Name] administration for review and input.

Step 7 Objective and target documentation will be retained for at least 2 years.

Responsible Person: _____

Signature and Date: _____

Summary of EMS Objectives and Targets

Objective	Target	Aspect Addressed	Measurable Parameters for Tracking Progress

Responsible Person

Effective Date

Action Plan for EMS Objective and Target

OBJECTIVE: _

TARGET(S): _

BASELINE: _

ASPECT(S): _

Parameter	Measurement Frequency

OPERATION(S) THAT ARE SOURCE(S) OF ASPECT(S) ADDRESSED: _____

ACTIONS PLANNED AND TAKEN TO ACHIEVE OBJECTIVE

Consider what type of actions you are evaluating to achieve targets for objectives. Are there pollution prevention alternatives such as source reduction, material substitution, in-process recycling, or waste minimization that could achieve your objectives and targets? Try to find an action that addresses the source most directly.

Action 1: _____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

Action 2: _____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

Responsible Person

Effective Date

Action Plan for EMS Objective and Target

Action 3: _____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

Action 4: _____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

Action 5: _____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

Action 6: _____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

Notes: _____

Responsible Person

Effective Date

Action Plan for EMS Objective and Target (Example)

OBJECTIVE: Purchase “Greener” Janitorial Chemicals

TARGET(S): Replace 3 high-use products with “green” alternatives

BASELINE: January 2001 Janitorial Chemical Use (see January Use Audit – not attached)

ASPECT(S): Human health and ecological safety

Parameter	Measurement Frequency

OPERATION(S) THAT ARE SOURCE(S) OF ASPECT(S) ADDRESSED: Building services

ACTIONS PLANNED AND TAKEN TO ACHIEVE OBJECTIVE

Consider what type of actions you are evaluating to achieve targets for objectives. Are there pollution prevention alternatives such as source reduction, material substitution, in-process recycling, or waste minimization that could achieve your objectives and targets? Try to find an action that addresses the source most directly.

Action 1: Review purchasing records to determine high-use products

Resources Needed: Purchasing records

Deadline: July 1, 2001

Responsible Person: Jim S.

Action Taken: June 1, 2001 – Identified five high-use products for action: toilet bowl cleaner, carpet spot remover, glass cleaner, metal cleaner, and bathroom cleaner.

Action 2: Obtain current MSDSs for high-use products

Resources Needed: MSDSs

Deadline: July 31, 2001

Responsible Person: Jim S.

Action Taken: June 15, 2001 – Obtained MSDSs.

Responsible Person

Effective Date

Action Plan for EMS Objective and Target (Example)

Action 3: Establish criteria to evaluate the environmental preferable purchase of janitorial products

Resources Needed: EMS team to help establish criteria

Deadline: August 31, 2001

Responsible Person: _____

Action Taken: July 1, 2001 – Gathering criteria from other organizations, haven't yet selected one.

Action 4: Screen high-use products against criteria and determine target products to find replacements

Resources Needed: MSDSs and scoring team

Deadline: September 31, 2001

Responsible Person: _____

Action Taken: _____

Action 5: Seek alternative products for targeted high-use products and screen potential replacements against criteria.

Resources Needed: Alternative product MSDSs

Deadline: November 15, 2001

Responsible Person: _____

Action Taken: _____

Action 6: Request samples of alternative products and evaluate performance. Establish contracts for approved alternative products.

Resources Needed: Samples and vendor contact information

Deadline: December 31, 2001

Responsible Person: _____

Action Taken: _____

Notes:

Responsible Person

Effective Date

OPERATIONAL CONTROLS

Operational controls are documented procedures that apply to operations with significant environmental aspects or operations related to EMS objectives and targets. The purpose of operational controls is to build environmental performance into daily C/U operations. While the rationale for creating operational controls is to minimize environmental concerns and achieve consistent compliance, as a practical matter writing and managing procedures for the numerous and diverse operations at a C/U would be burdensome and time-consuming. Therefore, C/Us should exert discretion as to the number and focus of written operational controls to ensure that the procedures that are written are clearly communicated and genuinely implemented. Often, procedures will already exist for operations with significant environmental aspects in which case the EMS should reference such documentation.

Operational control procedures should be considered if activities are causing compliance or liability problems, are completed inconsistently by different people, or require complex recordkeeping. Procedures should state (1) to whom the procedure applies, (2) to which operations the procedure applies, (3) steps that must be followed to complete the operation or activity, and (4) any training required to execute the procedure properly. Examples of C/U operations that might require written control procedures include:

- ✓ Hazardous materials management
- ✓ Hazardous waste handling storage and disposal
- ✓ Laboratory chemical tracking and use
- ✓ Pest management (typically in the form of integrated pest management plan)
- ✓ Fuels management (fueling, storage, and spill prevention)
- ✓ Worker safety

In many cases, operational controls less formal than written procedures are equally effective. For example, an inspection log for the hazardous waste storage area, brief checklists, or signs with simple instructions can be simple operational controls. One such example of a procedure and checklist covering storm water inspections is included in this element.

Implementation: *Procedure 2.4, Operational Control*, describes how to identify what operational controls are needed. The Operation Control form can be used to document operations for which written control procedures are required; both existing procedures and procedures developed as part of this EMS should be recorded.

PROCEDURE 2.4

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	2.4
	Effective Date	
	Subject	Operational Control

Purpose This procedure is used to document and track which [C/U Name] operations with significant environmental aspects require operational controls.

Step 1 Using the list of significant environmental aspects developed from the aspects review completed as part of *Element 2.1, Environmental Aspects and Impacts*, the EMS Manager will identify [C/U Name] operations that potentially require written procedures.

Step 2 The EMS Manager will then identify operations for which operational control is achieved through existing procedures or practices.

Step 3 The EMS Manager with the assistance of appropriate [C/U Name] departmental and facility staff, will identify operations with significant environmental aspects that require new procedures to achieve operational control.

Step 4 Depending on the significance and liability associated with a given operation, the EMS Manager, with the assistance of appropriate [C/U Name] departmental and facility staff, will determine the level of detail, training required, and frequency of review and revision for each operational control; details will be recorded in the procedure for each operation.

Step 5 Documentation of operational control will be achieved using the Operational Control form and will be retained by the EMS Manager.

Responsible Person: _____

Signature and Date: _____

OPERATIONAL CONTROL

Operations	Significant Aspect	Procedure Title	Responsible Party

Responsible Person

Effective Date

OPERATIONAL CONTROL

EXAMPLE

Operations	Significant Aspect	Procedure Title	Responsible Party
Hazardous Waste Management	Potential Leaks, Spills	Hazardous Waste Storage Area Checklist	Maintenance Supervisor
Hazardous Waste Management	Potential Leaks, Spills	Material Handlers Monthly Operations Meeting	Maintenance Supervisor
Grounds Maintenance	Potential Contamination of Campus Hill Brook	Storm Water Visual Observation Form	EH&S Technician
Wastewater Discharge To POTW	Potential Damage To POTW Potential Water Contamination	Wastewater Sampling Procedure	Maintenance Supervisor
Wastewater Discharge To POTW	Potential Damage To POTW Potential Water Contamination	Preventive Maintenance – pH adjustment tank, monitor and alarm	Maintenance Supervisor

Responsible Person

Effective Date

Storm Water Discharge Visual Observation Form

Example

Requirements

PROCEDURE: Visually observe storm water discharges for the presence of pollutants.

FREQUENCY: One storm event per month during the wet season (October 1 - May 30), during the first hour of discharge, during daylight hours, during scheduled facility operating hours, storms that are preceded by at least three (3) working days without storm water discharges.

LOCATIONS:

- (1) SW-01 – Storm Drains
- (2) SW-02 – Roof Downspouts
- (3) SW-03 – Storm Water Culvert

OBSERVATION: Presence of any floating and suspended material, oil and grease, discolorations, turbidity, odor, and the source of any pollutants.

Observed By _____

Date _____

Title _____

Time _____

Month _____

Time Storm Started _____

Location	Describe Discharge	Describe Source of Discharge
SW-01 Storm Drains		
SW-02 Roof Downspouts		
SW-03 Storm Water Culvert		

Comments/Corrective Actions Taken:

Responsible Person _____

Effective Date _____

ROLES AND RESPONSIBILITIES

An EMS should establish roles and responsibilities for the key players involved in the EMS, from top administration to committee members. By listing roles and responsibilities each person knows what influence they will have and how it will affect their workload. On a larger scope, this gives credibility and authority to the EMS initiative.

Top administration plays a very important role on a couple of levels by providing the necessary resource commitment and by giving the EMS initiative high visibility. Top administration should also designate a C/U representative who (1) ensures that the EMS is established; (2) reports on EMS performance over time; and (3) works with others to modify the EMS when necessary

When assigning roles and responsibilities, be cognizant of your CU's size, internal structure and unique characteristics. For example, smaller C/Us usually have less hierarchy, more direct lines of communication, and faster decision-making processes. And because staff at smaller C/Us often performs multiple functions, integrating environmental responsibilities with other functions can simplify the EMS structure and minimize use of resources. Medium-sized and large C/Us on the other hand may have significantly more specialized expertise and resources but also more bureaucracy; as a result, they must strive to break down interdepartmental barriers and operate collaboratively to create an efficient and functional EMS.

Implementation: *Procedure 3.1, Roles and Responsibilities*, describes how to assign responsibilities and determine organizational roles for the EMS. The procedure can be implemented, in part, through the Responsibilities Matrix and Organizational Chart. The matrix and chart should be used to plan and assign EMS responsibilities and can also be used to communicate these responsibilities to other people in the C/U. After EMS responsibilities have been assigned, it will be helpful to develop an organizational chart showing responsible employees, lines of communication and reporting, and any hierarchy that may be in place. In addition, an example C/U EMS organization chart has been provided as a possible starting point for developing one for your C/U.

Considerations in assigning and reviewing EMS roles and responsibilities:

- Personnel involved
- Training and resources required
- Results of previous audits
- Improvement of current structure
- Integration with other C/U functions and existing management systems

PROCEDURE 3.1

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.1
	Effective Date	
	Subject	Roles and Responsibilities

- Purpose** This procedure is used to determine the organizational roles and personnel responsibilities for the [C/U Name] EMS.
- Step 1** [C/U Name] Administration will first designate an EMS Manager whose role is to oversee [C/U Name] and lead EMS development and implementation. The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for implementing the EMS.
- Step 2** The EMS Manager will develop and assign EMS roles and responsibilities and document them using the Responsibility Matrix and Organizational Chart.
- Step 3** The EMS Manager will communicate EMS roles and responsibilities.
- Step 4** The EMS Manager and other EMS Participants will review and update the EMS roles and responsibilities every 12 months.
- Step 5** Roles and responsibilities documentation will be retained at the facility for at least 2 years.

Responsible Person: _____

Signature and Date: _____

RESPONSIBILITY MATRIX

	Administration	Environmental Health and Safety			Facilities and Building Maintenance			Academic Departments			Campus Environmental Groups	
Responsibility	President/Chancellor/Provost	EH&S Director	EH&S Staff	Student Staff	Zone/Department Managers	Field Supervisors	Field Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Chemical Hygiene Committee	Sustainable Practices Committee
Communicate importance of environmental management												
Coordinate auditing efforts												
Track / analyze new regulations (and maintain library)												
Obtain permits and develop compliance plans												
Prepare reports required by regulations												
Coordinate communications with interested parties												
Train employees												
Comply with applicable regulatory requirements												
Integrate environmental into performance appraisal process												
<i>Communicate with contractors on environmental expectations</i>												
<i>Conform with organization's EMS requirements</i>												
<i>Maintain equipment / tools to control environmental impact</i>												
<i>Coordinate emergency response efforts</i>												

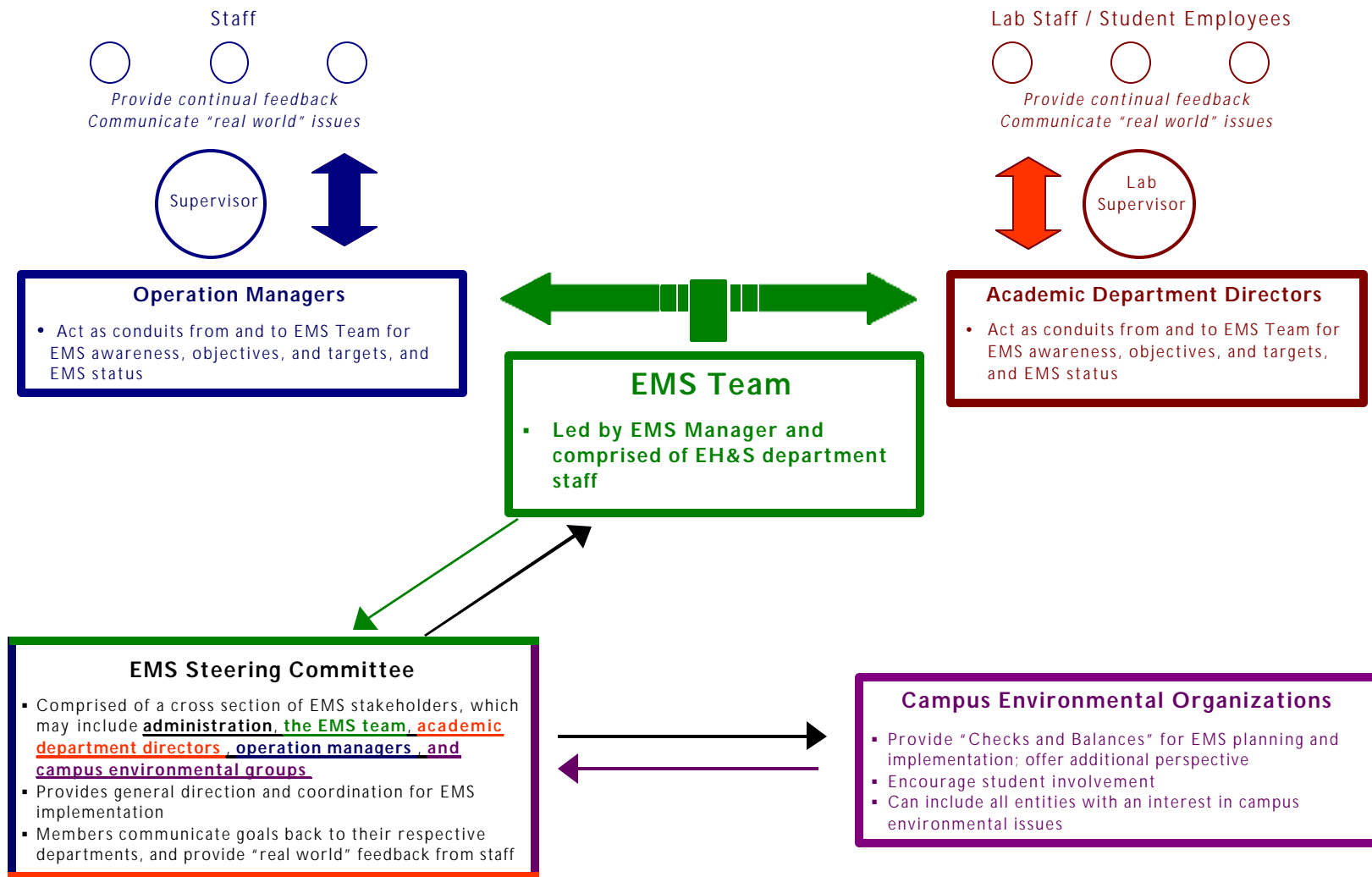
Responsible Person

	Administration	Environmental Health and Safety			Facilities and Building Maintenance			Academic Departments			Campus Environmental Groups	
Responsibility	President/Chancellor/Provost	EH&S Director	EH&S Staff	Student Staff	Zone/Department Managers	Field Supervisors	Field Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Chemical Hygiene Committee	Sustainable Practices Committee
Identify environmental aspects of products, activities, or services												
Establish environmental objectives and targets												
Monitor processes with priority aspects												
Develop budget for environmental management												
Maintain EMS records (training, etc.)												
Coordinate EMS document control efforts												
Ensure that the EMS requirements are implemented and maintained in accordance with the [C/U name] environmental policy and procedures												
Report on the performance of the EMS to top administration for review and as a basis for improvement of the EMS												

Source: Adapted from Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001

Responsible Person

Example C/U EMS Organization



ELEMENT 3.2

COMMUNICATION

Both internal and external communications about the EMS should be planned and implemented to ensure that environmental goals are met. Internal communication should explain the environmental policy and address the EMS roles and responsibilities delegated to employees as well as progress toward specific objectives and targets.

Two particularly unique audiences at colleges and universities for **internal communication** are faculty and students. Faculty should be part of the EMS effort and be solicited for input and advise where appropriate; specifically faculty is critical where their activities are sources of environmental aspects; for example, hazardous waste from laboratories or art studios. Faculty that works with chemical products containing hazardous constituents can be invaluable advisors regarding the environmental aspects and impact of the products used and the handling, storage, and disposal regulations that apply to waste material. Students, likewise, may have unique roles in the EMS. Some C/Us rely on students to gather information about operations and processes linked to EMS objectives and targets. Furthermore, all students should be aware of their ability to affect environmental aspects related to waste generation (especially solid waste and recycling) and resource use (especially energy and water use).

Likewise, **external communication** is also an important element of the EMS. Communication with interested parties such as regulators, insurers, grant organizations, local community members, alumni, and emergency responders (See Element 3.5) interested in the environmental impacts of the C/U should be addressed and documented. By maintaining meaningful dialogue and a proactive approach with external parties, a C/U can fulfill its environmental policy and realize EMS objectives.

Effective communication can:

- Motivate your workforce;
- Gain acceptance for your plans and efforts;
- Explain your environmental policy and EMS and how they related to the overall organization vision;
- Ensure understanding of roles and expectations;
- Demonstrate management commitment;
- Monitor and evaluate performance; and,
- Identify potential system improvements

Implementation:

Procedure 3.2a, Internal Communication and *Procedure 3.2b, External Communication* describe how and when to initiate and document internal and external communication respectively and can be implemented, in part, through the *Internal Communications* form and *External Communications* form. Both internal and external emergency communications can be implemented through the *Emergency Responses Communications* form.

Each of the forms include examples of common types of C/U communications, but each organization should tailor their communication plans to reflect existing methods that are effective and the unique characteristics of the audiences with which it interacts. Each of the three forms should be used as a planning tool to catalogue the types of communication and the intended

audience; once identified, each type of communication can then be refined and assigned to responsible parties.

In addition, your C/U may find the concept of an "EMS Bulletin Board" a useful one to aid in communicating your EMS initiatives and progress to a wider audience. For C/Us, an EMS bulletin board can be implemented as a tangible paper and cork version located in the work area of the EMS Team, the Student Union, Faculty Lounge, or electronically through an intranet site, or all, depending on the content and the intended audience. The "EMS Bulletin Board Checklist," helps provide (1) suggested audiences for your EMS bulletin board, (2) lists of documents you should consider putting on the EMS bulletin board, and (3) tips for developing and displaying your EMS bulletin board.

DRAFT

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.2a
	Effective Date	
	Subject	Internal Communication

Purpose This procedure is used to ensure adequate internal communication about the EMS.

Step 1 The EMS Manager will identify internal audiences, including faculty employees, students, staff, and possibly contractors of [C/U Name] who play a role in everyday operations.

Step 2 The EMS Manager will determine the type of information that needs to be communicated including general information regarding the EMS policy, individual EMS responsibilities, or specific waste reduction targets and measurements.

Step 3 Depending on the audience and information to be communicated, the EMS Manager will determine methods of internal communication. Initial forms of internal communication may include training, followed by meetings and postings via email, intranet, websites, newsletters, or bulletin boards.

Step 4 The EMS Manager will determine the frequency of internal communication depending on the types of information being communicated.

Step 5 The EMS Manager and other appropriate [C/U Name] staff (identified in the internal communications form) will ensure that adequate internal communication occurs.

Step 6 Internal communications will be planned using the Internal Communications and the Emergency Response Communications forms. Records of all internal communication will be retained (i.e., for at least 2 years).

Responsible Person: _____

Signature and Date: _____

INTERNAL COMMUNICATIONS

Instruction: Use this form as a planning tool to identify the internal communications opportunities for your EMS.

Type of Information	EMS Awareness Training	Job Specific Training	Email/ Intranet/ Website	EMS Meeting	Administration Meeting	EMS Bulletin Board	Newsletter
President/Chancellor							
EH&S Director							
EH&S Staff							
Facility Manager							
Field Supervisors							
Department Heads							
Laboratory Supervisor							
Laboratory Staff							
Campus Environmental Group Director							
Campus Environmental Member Groups							

Responsible Person

3.2-4

Element 3.2

Effective Date

PROCEDURE 3.2b

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.2b
	Effective Date	
	Subject	External Communication

- Purpose** This procedure is used to ensure adequate external communication.
- Step 1** The EMS Manager will identify external audiences. External audiences may include suppliers, neighbors, community groups, local officials, insurers, alumni, other C/Us, regulatory agencies, and emergency responders.
- Step 2** The EMS Manager will determine the type of information that needs to be communicated. Information may include waste reduction successes, permit applications for new processes, or future plans to change processes or practices.
- Step 3** Depending on the audience and information to be communicated, the EMS Manager will determine methods of external communication.
- Step 4** The EMS Manager will determine the frequency of external communication depending on the types of information being communicated.
- Step 5** The EMS Manager and other appropriate [C/U Name] staff (identified in the external communications form) will ensure that adequate external communication occurs.
- Step 6** External communications will be planned using the External Communications and the Emergency Response Communications forms. Records of all external communication documentation will be retained for at least 2 years.

Responsible Person: _____

Signature and Date: _____

EXTERNAL COMMUNICATIONS

Instruction: Use this form as a planning tool to catalogue the external communications required for your EMS. For each external communication topic determine the audience (to whom?) and necessary frequency (how often?). Document this plan by entering the audience and frequency for each form of communication.

Type of Information	Audience/Frequency						
	Community Meeting	Individual Meeting	E-Mail/ Website	Newsletter	Press Release	Other	C/U Group
Example – Environmental Policy							
Environmental Policy							
EMS Objectives and Targets							
Waste Reduction Successes							
Health and Safety Successes							
Preventive Actions							
Results of Audits and Administration Review							
Changes Planned							
Permit Applications							
Annual Environmental Report							
Other							

Responsible Person

Effective Date

EMS Bulletin Board Checklist

Many companies are best able to communicate their EMS to a broader group of employees by creating a "Bulletin Board EMS." You can do the same by selecting the key documents important to the day-to-day, week-to-week maintenance and tracking of the EMS and posting them for others in the C/U to see. By doing so, you can:

- ✓ Educate faculty, students, and staff on the purpose and direction of the EMS.
- ✓ Identify EMS objectives and targets.
- ✓ Engender wider "ownership" of the EMS objectives and targets.
- ✓ Show measurement and monitoring metrics in tables and charts
- ✓ Update and inform faculty, students, and staff of progress in reaching objectives and targets.
- ✓ Promote accomplishments and challenges faced by the C/U.
- ✓ Collect suggestions from faculty, students, and staff on ways to achieve objectives and targets.

The following is a list of suggested documents that you may want to be part of the "Bulletin Board EMS"

- ✓ Environmental Policy: signed by the C/U administrators and translated into appropriate languages (Element 1.1)
- ✓ "Summary of Objectives and Targets" form: lists each objective, target (numerical and deadline) on one page (tool from Element 2.3)
- ✓ Measurement and Monitoring Metrics: Tables and charts that track progress for each objective and target (Element 4.1)
- ✓ Roles and Responsibilities Organizational Chart: Chart showing names and responsibilities for EMS Team members and others as appropriate

TRAINING

Training is an important aspect of any EMS because it can be used to build awareness and competency on (1) the EMS and (2) specific tasks related to meeting EMS objectives and targets. Training at C/Us is often further complicated by the complex and diffuse nature of their organizational structure, and the number of different departments in which EMS Participants work.

The goal of a C/U's EMS training should be three-fold:

1. EMS Awareness – provide understanding of what the C/U's EMS is and how it works
2. Task-Specific Training – to provide task-specific training on topics to those EMS Participants able to aid progress toward the EMS objectives and targets
3. Training Required by Regulations – to comply with applicable environmental and health and safety training requirements

Potential Training Resources:

- EMS Team Members
- Computer-Based Training
- Departmental Professors
- Graduate Students
- Suppliers/Vendors
- Self-Directed Study
- Outside Consultants

In tackling EMS Awareness training, develop an agenda and materials for EMS information you want every EMS Participant to understand and then add training modules to accommodate the specific needs of particular audiences. For example, the EMS Team likely wants each EMS Participant to understand the C/U's:

- Environmental policy;
- Significant environmental aspects and impacts;
- EMS roles and responsibilities; and
- Initiatives for meeting EMS objectives and targets.

In addition, the EMS Team may want to develop specific EMS awareness training modules such as:

- “EMS Costs and Benefits” for C/U administration
- “EMS Administration Review” for the EMS Administration Review Team
- Environmental Policy for new student orientation

Training Hints:

- Incorporate EMS Awareness Training into existing training received by EMS Participants and consider making the training a regularly scheduled update.
- Consider on-line training as a way to accommodate varying schedules and far-flung audiences
- Consider videotaping training sessions for use later as refreshers or with new employees.
- Factor training needs and abilities into hiring practices.

Implementation: Use the following steps, *Procedure 3.3, Training*, and the two tools provided in this element (EMS Training Matrix and Individual EMS Training Plan) to build a list of training needs for each EMS Participant.

1. Identify Training Needs – Catalogue training needs for each employee in each of the three categories listed above and fill in the EMS Training Matrix starting with EMS Awareness Training topics listed above, adding task-specific training relating to specific objectives and targets, and finally adding Training Required by Regulations (often apparent after performing a compliance review as part of *Element 2.2, Compliance*). This training matrix will help you determine “big picture” training needs and develop individual training plans according to one’s position. This tool might also be useful for managers when estimating training expenses and planning for new employee training and orientation. An example of a completed EMS Training Matrix is provided.
2. Complete training plans for individuals or categories of people (i.e., landscaping staff or laboratory managers) using the tool provided. An example of an EMS Training Plan is provided.
3. Conduct Needed Training – Building upon existing C/U training programs, identify training resources and conduct training.
4. Maintain Training Records – Use the EMS Training Plan to record the dates training is planned and the dates training has occurred.
5. Evaluate Training Effectiveness – Review the impact of training on EMS effectiveness through interviews of EMS Participants and considering the results of EMS Audits and Administration Reviews.

PROCEDURE 3.3

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.3
	Effective Date	
	Subject	Training

Purpose This procedure is used to develop and implement a training program for EMS Participants that (1) achieves EMS awareness, (2) provides task-specific training related to EMS operational controls, and (3) provides training required by regulations.

Step 1 The EMS Manager will identify training needs for each employee by completing the EMS Training Matrix and identifying training needs in any of three categories: EMS Awareness Training, Task-Specific Training relating to specific objectives and targets, and Training Required by Regulations.

Step 2 The EMS Manager and others will review past training and the nature of the employee's work and develop training plans for EMS Participants. Training plans will be developed, reviewed, and revised when the following events occur: a new hire is made, an EMS Participant's role or responsibility changes, a new material, process, equipment, or regulation is introduced to a department or functional area.

Step 3 The EMS Manager will arrange for and/or conduct needed training according to the schedule identified in the individual training plans.

Step 4 The EMS Manager will document dates, attendees and subject for past and planned training in the individual training plans. Training documentation will be retained at the facility for at least 2 years.

Step 5 Training effectiveness will be evaluated annually as part of the administration review to ensure that EMS training is contributing to the EMS being implemented effectively; appropriate changes to the training program will be made based on the findings.

Responsible Person: _____

Signature and Date: _____

TRAINING MATRIX

	Environmental Health and Safety				Facilities and Building Maintenance				Academic Departments					Campus Environmental Groups	
	President/Chancellor	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
Responsibility															
EMS Awareness															
Supervisor EMS Training															
EMS Audit Training															
Hazardous Waste Management															
Spill Prevention and Response															
Chemical Handling															
Emergency Response															
Hazard Communication															

Responsible Person _____

Effective Date _____

Responsibility	President/Chancellor	Environmental Health and Safety			Facilities and Building Maintenance				Academic Departments					Campus Environmental Groups	
		EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
Personal Protective Equipment															
Fire Safety															
Electrical Safety															
Equipment Training (job specific)															
Compliance Audit Training															
P2 Audit Training															
Regulation Review/Update															
Laboratory Procedure Training															

Responsible Person _____

Effective Date _____

TRAINING MATRIX – EXAMPLE

		Environmental Health and Safety			Facilities and Building Maintenance					Academic Departments				Campus Environmental Groups	
Responsibility	President/Chancellor	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
EMS Awareness Training - University EMS Status Updated - Semi-Annual Policy Review & Development	X		X	X		X	X	X		X	X	X	X	X	X
Supervisor EMS Training - EMS Awareness Training Development - Objective and Target Communication Training - Policy Implementation Training		X			X	X	X			X	X			X	X

Responsible Person

Effective Date

		Environmental Health and Safety			Facilities and Building Maintenance					Academic Departments				Campus Environmental Groups	
Responsibility	President/Chancellor	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
EMS Audit Training		3-4 Auditors should be chosen to conduct EMS Audit. This should be a rotating responsibility among EMS Staff. Note: If possible, ensure staff does not audit their own facilities to preserve independence of the audit.													
Hazardous Waste Management - 40 – Hour OSHA Training & Certification - University-Specific Policy Review			X	X			X	X			X	X	X		
Compliance Audit Training		X	X												
P2 Audit Training - Job-Specific P2 Audit Training - P2 Communication and Implementation Training		X	X			X	X				X				

Responsible Person

Effective Date

(Job Function) Training Plan

Subject: _____

Date: _____

***All training planned and completed by the EMS Participant should be recorded below; attach training agendas, materials, and sign-in sheets as appropriate.**

[illegible]

Grounds/Landscape Maintenance Training Plan – Example

Subject: 40-Hour OSHA Training

Date: FY 2001-02

***All training planned and completed by the EMS Participant should be recorded below; attach training agendas, materials, and sign-in sheets as appropriate.**

Employee Name	Date Planned	Date Completed	Signature of Employee
Sara Usepa	9/00	10/01/01	

EMS DOCUMENT CONTROL

The primary focus of your C/U's EMS document control should be to implement an effective EMS, not a large document control system. Even in the most streamlined systems, there are several documents that are integral to the EMS, including the environmental policy and various written procedures, records, and forms used to implement the EMS. **Document control ensures that EMS documents can be:**

- ✓ easily located;
- ✓ periodically reviewed; updated as needed; and
- ✓ removed when obsolete.

Controlled documents should be centrally located at your C/U, usually under the control of the EMS Manager. In addition, controlled documents should have the following features:

- Effective date
- Approval signature and date
- Copy number (if more than one controlled copy is required)

Why not use a computerized document control system?

With the relative ease of basic web programming and the near ubiquity of far-reaching computer networks and intranets at C/Us, consider maintaining the EMS on your LAN or on an intranet website. By so doing, document updates and distribution are quick, accurate, and auditable.

Implementation: *Procedure 3.4, EMS Document Control*, describes an example of how EMS documents should be controlled. To that end, this element includes a "Sample EMS Document Control Index" that can be used as a starting point to develop a means for tracking the generation, distribution, age, and most recent version of all controlled documents.

What EMS documents should be controlled? Consider the following:

- ☒ Environmental policy
- ☒ EMS description document ("manual")
- ☒ System-level procedures
- ☒ Process- or activity-level procedures / work instructions
- ☒ Related plans (such as emergency response plans)

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.4
	Effective Date	
	Subject	EMS Document Control

Purpose This procedure governs EMS document control and ensures that faculty and staff understand and have access to current terms, guidance, procedures and documents.

Step 1 The EMS Manager is responsible for EMS document control. Controlled EMS documents may include the following:

Controlled Document List for [C/U Name]

-
-
-
-

Types of Documents You Might Control (examples)

- ✓ Environmental policy
- ✓ EMS procedures (including this one)
- ✓ Blank forms used to implement EMS procedures:
 - Environmental Aspects and Impacts Review
 - List of Significant Environmental Aspects
 - Compliance Assessment
 - Environmental Management Programs (for each Objective and targets)
 - Organizational Chart
 - Individual Training Plans
 - Communication Forms
- ✓ An index of all documents and a

Step 2 The controlled EMS documents listed in Step 1 will be designated by headers and/or footers with the following:

- Effective date
- Approval signature and date
- Copy number

Responsible Person: _____

Signature and Date: _____

- Step 3** The EMS Manager will maintain a document control index of all documents and a distribution list that identifies other C/U personnel who should receive copies of EMS documents.
- Step 4** The master copy of the controlled EMS documents listed in Step 1 will be maintained under the control of the EMS Manager or their designee. The EMS team member signing the current version of controlled documents will be responsible for distributing new, and collecting obsolete documents.
- Step 5** The index of controlled EMS documents will be updated whenever one of the documents is revised.

Responsible Person: _____

Signature and Date: _____

Sample EMS Document Control Index

(Adapted from Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001)

Document	Location of Controlled Copies	Review Cycle	Name of Author and Date of Revision			
			1	2	3	4
Environmental Policy	1-EMS Manager 2-President Uncontrolled copies posted on all building lobby bulletin boards	Annual	John Smith EMS Manager 1/1/99	John Smith EMS Manager 1/1/00		
EMS Procedures: Environmental Aspects Compliance Objectives & Targets Roles and Responsibility Communications Training EMS Document Control Emergency Resp. & Prepare. Measurement & Monitoring EMS Nonconformance Corrective and Preventative Action for Compliance Records Audits Administration Review	1-EMS Manager only	Annual	John Smith EMS Manager 1/11/99	John Smith EMS Manager 1/21/00		
Standard Operating Procedures • Facilities Maintenance • Vehicle Maintenance • Waste Water Plant	1-EMS Manager 2Facilities Manager	Annual	Art Johnson- Facilities Manager 2/15/99	Art Johnson- Facilities Manager 2/28/00		
Compliance Assessment Protocol	1-EMS Manager only	Annual	AAA Envir. 6/15/99	AAA Envir. 6/1/00		

Document	Location of Controlled Copies	Review Cycle	Name of Author and Date of Revision			
			1	2	3	4
Communication Forms (Blank)	1-EMS Manager only	Annual	Barb Hall EMS Spec 2/1/99	Barb Hall EMS Spec 2/25/00		
EMS Audit Protocols	1-EMS Manager only	Annual	John Smith 1/11/99	John Smith 1/21/00		
Other related documents (list separately, e.g. SPCC Plan, Emergency Response Plan, etc.).	1-EMS Manager only	Annual	Barb Hall EMS Spec 2/1/99	Barb Hall EMS Spec 2/25/00		
Other forms and checklists (list)	1-EMS Manager	As Needed				

EMERGENCY RESPONSE AND PREPAREDNESS

Nearly all C/Us have experienced an event that required some kind of emergency response and most have suffered numerous events both large and small. Unfortunate events such as an employee injury, a spill of hazardous chemicals, or a fire do occasionally occur. With C/Us typically using a wide variety and quantity of hazardous chemicals, and having a wide range of faculty, students, and staff using those chemicals, the potential for accidents is high. As a result, C/Us must be particularly vigilant in planning and preparing for emergencies. Emergency planning can limit injuries; protect faculty, students, staff, neighbors and the environment; reduce asset losses; and minimize damage to the C/Us image.

An effective emergency response and preparedness program should include provisions for:

- Assessing the potential for accidents and emergencies
- Preventing incidents and their associated environmental impacts
- Responding to incidents, and
- Mitigating impacts associated with these incidents

Often, the most difficult part of developing emergency preparedness and response plans is identifying the potential for accidents and emergencies. The EMS Manager should form a team composed of C/U personnel (and outside consultants or local responders if necessary or beneficial) to examine all facility activities. Extend your evaluation beyond those materials and operations that are obviously or inherently dangerous; ask “what if” questions under both normal and abnormal conditions.

Implementation:

Procedure 3.5, Emergency Response and Preparedness, describes the personnel responsible for completing emergency preparations and incident reviews, and how and when the tasks will be completed. There are many overlapping requirements in local, state and federal regulations concerning emergency response and preparedness.

Helpful Documents for Gauging Emergency Risk and Making Preparations

- Site maps to determine relative locations of hazardous chemicals/wastes/operations to people and environmentally sensitive areas
- Drainage plans, including surface and subsurface conveyances
- Past records and reports of emergencies and any rectifying actions taken

Overlapping Emergency Response Requirements

Various federal programs require some sort of emergency response plan:

- RCRA
- Oil Pollution Act of 1990
- SPCC
- EPCRA
- Hazard Communications
- 40 CFR 1910.120

No tool is provided for this element because the tools and forms associated with emergency response and preparedness are already included as part of the documents required by federal, state, and local regulations.

EPA's Integrated Contingency Plan

U.S. EPA has attempted to address many of the federally required topics by producing a guidance document for an "Integrated Contingency Plan" covering oil and nonradiological hazardous materials. The guidance can be accessed at the EPA website: <http://www.epa.gov/swercepp/er-docs.htm> - top

DRAFT

PROCEDURE 3.5

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.5
	Effective Date	
	Subject	Emergency Response and Preparedness

Purpose This procedure is used to anticipate, document, prepare for, and review preparedness plans and emergency events.

Step 1 The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for identifying dangers, taking proactive steps to prevent emergency incidents, and completing tasks in preparation for emergencies.

Step 2 The EMS Manager will prepare and update an Emergency Response Plan that contains all emergency procedures required by local, state and federal regulatory agencies.

Step 3 The EMS Manager will familiarize and train appropriate faculty, students, staff, - and emergency coordinators on the procedures described in the Emergency Response Plan.

Step 4 For each emergency incident, the EMS Manager and the emergency coordinators will determine the cause of the emergency, evaluate the response to the incident, and identify actions to be taken to minimize its recurrence.

Step 4 At least twice per year, the EMS Manager and other EMS Participants will review the Emergency Response Plan and any emergency incidents that occurred since the last review.

Step 5 Documentation concerning emergency response and preparedness and emergency incidents will be retained at the facility for at least 5 years.

Responsible Person: _____

Signature and Date: _____

MEASUREMENT AND MONITORING

Basing decisions and operational improvements on quantified environmental performance data is an important part of the EMS philosophy and should be a central feature of your EMS. If the primary goal of an EMS is to improve environmental performance through consistent compliance and waste reduction, there must be measurable parameters, or metrics, that reflect environmental performance trends.

What is Environmental Performance?

The measurable results of the environmental management system, related to an organization's control of its environmental aspects, based on environmental policy, objectives and targets.

After objectives and targets are created, specific parameters must be identified and measured to track progress toward the objective and target. For example, if campus-wide energy use is a high-priority environmental aspect and energy use reduction is an objective, with a target of 10 percent reduction in the next 12 months, then parameters must be identified and periodically measured to determine whether the target is reached. In this example, a typical parameter that could be included is kilowatt-hours consumed annually.

Establishing baselines and monitoring programs can be especially difficult on C/U campuses. In some cases, a single department may not have complete control over an aspect, such as energy use, which makes measurement and monitoring particularly challenging. In these instances, it is important to make regular reporting a standard operating procedure and the responsibility of one person. Measuring and monitoring programs are also a good area to utilize student assistance; they can help to identify parameters, establish baselines, and maintain an established monitoring program (data collection and charting).

Target-Specific Metrics

Target-specific metrics are unique to your C/U's objectives and targets. Examples of metrics that relate to common objectives and targets are listed below.

- ♦ Energy use from on-campus dormitory lighting
- ♦ Water use in recreational and athletic facilities
- ♦ Monthly volume of halogenated solvents used by chemistry department laboratories
- ♦ Monthly use of floor strippers containing toxic chemicals by janitorial operations
- ♦ PC energy consumption from campus computer laboratories
- ♦ Monthly volume of pesticides used on campus for vector control in buildings
- ♦ Tons of waste concrete landfilled per quarter

Since all C/Us use water and energy, conservation of those two resources is a common target. Because they are consumed in so many ways, target-specific metrics should be defined in a

way that can be easily measured and monitored. Laboratory-generated wastes are another common target, and should be more easily measured because of regulatory compliance records.

Campus Metrics

Seven typical campus metrics that together provide at-a-glance information about C/U environmental performance are identified in the table below and may be used to understand your C/U's footprint and to benchmark against other C/Us. Remember that these are only sample metrics. Each C/U should choose at least one metric that is appropriate to each of its individual objectives and targets.

Potential Campus Metrics	
Metric	Description
Energy use	Energy (electricity, natural gas, or other power source) is a primary resource used by C/Us. It is important to track energy use to estimate equivalent CO ₂ emissions and the C/U's contribution to greenhouse gases. Tracking energy use is also necessary to realize the results of conservation practices.
Water use	Water is an important natural resource used by C/Us and can be significantly reduced through conservation practices. Additionally, water use in laboratories relates to wastewater generation and water use in landscaping contributes to pesticide and fertilizer runoff.
Laboratory hazardous wastes	Hazardous waste generation from laboratories is likely the greatest health and safety and compliance concern for C/Us. Because laboratories are often scattered throughout the campus, it is important to develop a consistent approach that will include a measuring and monitoring program that reflects the activities for the entire campus.
Janitorial chemicals	The janitorial staff uses industrial strength cleaning solutions, some of which may pose a potential threat to human health and the environment. The effects of environmentally preferred purchasing initiatives should be measured.
Computer/IT wastes	C/Us often strive to utilize the latest technologies. Often, computers and other information technology products have a short lifespan, which creates a significant source of waste that may be subject to special disposal requirements. This issue is relatively new to all industries.
Construction- and renovation-associated wastes	C/U campuses are constantly improving existing facilities and building new ones. Construction- and renovation-associated wastes are a significant concern, but often difficult to measure. Also, this waste is often managed by the contractor, in which case it is important to set measuring and monitoring expectations at the beginning of the project.
Vehicle fuel and chemical use	C/Us typically have a large number of trucks, passenger vehicles, buses, and construction and landscaping vehicles all requiring fuel and various hazardous and toxic maintenance chemicals. Tracking their use and measuring reductions is an important measure of a C/Us environmental footprint.
Compliance	Some ways to measure compliance performance may include: <ul style="list-style-type: none"> • Number, type and seriousness of violations cited in regulatory inspections • Were internal or third party audits conducted? • Number type and seriousness of violations observed in internal or third party audits • Number of Repeat violations observed • Were all items listed on the Compliance Calendar accomplished and on schedule?
EMS Conformance	Some ways to evaluate EMS conformance may include: <ul style="list-style-type: none"> • Were EMS awareness and training conducted • Were internal EMS audits conducted? • Number type and seriousness of non-conformances observed in EMS audits
Accomplishment of Objectives and Targets	Are objectives and targets as set in the EMS being accomplished on schedule?

Implementation: *Procedure 4.1, Measurement and Monitoring*, describes what parameters will be tracked, how often, and by whom.

DRAFT

PROCEDURE 4.1

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	4.1
	Effective Date	
	Subject	Measurement and Monitoring

Purpose This procedure is used to implement a measurement and monitoring program designed to support the EMS and specific EMS objectives and targets.

Step 1 The EMS Manager and EMS Team will track the campus metrics by collecting and charting data relevant to the metric, including those identified below. The EMS Manager and EMS Team will identify and measure unique parameters for each EMS objective and target.

Campus Metric	Data Collection Frequency	Responsibility
Energy Use		
Water Use		
Laboratory Hazardous Wastes		
Janitorial Chemicals		
Computer/IT Wastes		
Construction- and Renovation-associated Wastes		
Vehicle and Fuel Chemical Use		
Compliance		
EMS Conformance		
Accomplishment of Objectives and Targets		

Step 2 The EMS Manager and EMS Team will measure, monitor, and record target-specific parameters at a predetermined frequency.

Step 3 The EMS Manager and EMS Team will review campus and target-specific measurement and monitoring data every 3 months to identify trends, evaluate progress toward meeting EMS objectives and targets, and discuss overall environmental performance.

Responsible Person: _____

Signature and Date: _____

EMS NONCONFORMANCE AND CORRECTIVE ACTION

EMS audits (see Element 4.5), day-to-day EMS procedure implementation, and administration reviews will occasionally reveal deficiencies in the C/U's EMS or activities that do not conform to the EMS. When nonconformance is identified, corrective action must be taken to address and rectify the causes of the nonconformance to continually improve the EMS. Examples of EMS nonconformance are described below.

Example 1: Monthly EMS Meetings not held on a routine basis.

Example 2: EMS Participants are unaware of their EMS-related responsibilities.

Example 3: Labeling in laboratories still shows deficiencies.

Implementation:

Procedure 4.2, EMS Nonconformance and Corrective Action, describes how and when corrective action will be taken. The procedure is implemented, in part, through the EMS Nonconformance Corrective Action form. This form should be used to document corrective actions discovered during EMS audits, day-to-day EMS procedure implementation, and administration reviews. Specifically, the form enables you to document the event and its resolution by describing the "problem" (the EMS nonconformance), the most likely causes of the problem, possible solutions, implemented solution (corrective actions), and results. Use judgment in choosing when to employ the Corrective Action form to avoid unnecessary paperwork. Minor one-time occurrences which can simply be fixed on the spot need not necessarily generate paperwork. Forms should be used for documentation and follow up for serious or repeated nonconformances or for corrective actions which will require more than a quick fix.

What are typical causes of EMS deficiencies?

- Inadequate "buy-in" from critical EMS Participants: administration, specific departments/groups within the C/U, etc.
- Over-ambitious EMS scope, schedule, or goals
- Insufficient labor resources or delegation of responsibility
- Poor communication
- Faulty or missing procedures
- Failure to enforce procedures
- System or equipment malfunction due to lack of monitoring or maintenance
- Inadequate training
- Inadequate EMS awareness

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	4.2
	Effective Date	
	Subject	EMS Nonconformance Corrective Action

Purpose This procedure is used to track EMS nonconformances and identify root cause and corrective action. Forms should be used for documentation and follow up for serious or repeated nonconformances or for corrective actions which will require more than a quick fix.

Step 1 A corrective action that responds to EMS nonconformance is initiated using the attached EMS Nonconformance Corrective Action form. Corrective action may be initiated by a variety of events including internal audits, administration reviews, employee suggestions, and routine EMS procedures. The form describes the EMS nonconformance or deficiency, identifies the root cause(s) of the problem, describes the implemented solution, and summarizes the resolution of the corrective action.

Step 2 The EMS Nonconformance Corrective Action form will be signed by the EMS Manager or designee.

Step 3 The responsible person must report the status of corrective actions to the EMS Manager at least every 2 weeks.

Step 4 Completed corrective action forms will be retained on site for at least 2 years after completion of the corrective action.

EMS Nonconformance Corrective Action Form

Problem Identified: _____

Resolution Due Date: _____

Problem Identified By: _____

Problem (describe existing or anticipated problem):

Most Likely Cause(s):

Due Date: _____

Completed: _____

Possible Solution(s):

Due Date: _____

Completed: _____

Implemented Solution(s):

Due Date: _____

Completed: _____

Resolution (confirm effectiveness of implemented solutions):

Responsible Person

4.2-3

Element 4.2

Effective Date

EMS Nonconformance Corrective Action Form

EXAMPLE

Problem Identified: June 2001 Resolution Due Date: July 2001

Problem Identified By: Chemistry Department Laboratory Supervisor

Problem (describe existing or anticipated problem): EMS Management Team failed to conduct a cost-benefit analysis on implementation of new chemical tracking and inventory system, which was identified as an action item during the first quarter EMS steering committee meeting. Original due date for analysis was May 1, 2001.

Most Likely Cause(s):

- EMS Management Team focused on preparing for regulatory compliance audit during June 2000.
- Chemistry department did not follow-up with EMS Management Team.
- Lack of information to estimate costs of implementing system described above.

Possible Solution(s):

- Schedule working meeting between Chemistry department staff and EMS cost-benefit analysis team.
- Research chemical tracking and inventory systems (assign to Chemistry student staff) and report finding to EMS Management Team.

Implemented Solution(s):

Due Date: July 2001

Completed: July 2001

- Chemistry student staff researched existing chemical tracking and inventory systems and reported to EMS Management Team on June 30, 2001.
- Chemistry Department and EMS cost-benefit team met on July 7, 2001 to discuss findings.
- EMS Management Team completed cost-benefit analysis on July 15, 2001 and plans to implement new system are being determined cooperatively between chemistry laboratory staff and EMS team.

Resolution (confirm effectiveness of implemented solutions):

Responsible Person

4.2-4

Element 4.2

Effective Date

***CORRECTIVE AND PREVENTIVE ACTION
FOR COMPLIANCE***

Regulatory compliance audits, self-inspections, and measurement and monitoring activities will occasionally reveal (1) instances of noncompliance with regulations, or (2) situations that are contrary to objectives and targets. When these situations do occur, corrective action must be taken to address and rectify the causes of the noncompliance or realign actions to meet specific objectives and targets.

Preventive actions should be taken when breakdowns in administrative systems and measurement and monitoring of operational systems indicate critical processes are not "in control." For example, if wastewater discharge monitoring shows a steady increase in pollutant concentrations that approach the discharge limit, preventive action should be taken to ensure that the wastewater treatment system is operating correctly. Similarly, if internal hazardous waste storage self-audits indicate improper labeling or exceedences of 90-day storage limits, corrective action must be taken immediately to rectify the situations and preventative action must be taken to avoid reoccurrence. In this way, the measurement and monitoring program and preventive action are directly linked. Similarly, measurements taken to evaluate progress toward various pollution prevention targets (for example, microscale chemistry or product substitution) may suggest preventive actions to ensure continued progress.

Implementation:

Procedure 4.3, Corrective and Preventive Action for Compliance, describes how and when actions will be taken. The procedure is implemented, in part, through the Corrective and Preventive Action form. This form should be used to document corrective and preventive actions. Specifically, the form enables you to describe the "problem" (the noncompliance event or situations inconsistent with meeting specific targets), the most likely causes of the problem, possible solutions, implemented solution (corrective actions), and results.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	4.3
	Effective Date	
	Subject	Corrective and Preventive Action for Compliance

Purpose This procedure is used to respond to deficiencies and noncompliance with environmental regulations.

Step 1 Preventive action or corrective action that anticipates or responds to noncompliance is initiated using the attached Corrective and Preventive Action for Compliance form. Corrective or preventive action may be initiated by a variety of events including internal audits, administration reviews, employee suggestions, and routine EMS procedures. The form can be used to document the problem, identify the cause(s) of the problem, describe the implemented solution, and summarize the resolution of the corrective action.

Step 2 The Corrective and Preventive Action for Compliance form will be signed by the EMS Manager or designee and the person responsible for the actions taken.

Step 3 The responsible person must report the status of corrective actions to the EMS Manager at least every (Insert time frequency appropriate for your [C/U Name] and circumstances).

Step 4 Completed Corrective and Preventive Action forms will be retained on site for at least 2 years after completion of the corrective or preventive action.

Responsible Person: _____

Signature and Date: _____

Corrective and Preventive Action for Compliance Form

Noncompliance or Potential Noncompliance

Problem Identified: _____ Resolution Due Date: _____
Problem Identified By: _____

Problem (describe existing or anticipated problem):

Most Likely Cause(s):

Due Date: _____
Completed: _____

Possible Solution(s):

Due Date: _____
Completed: _____

Implemented Solution(s):

Due Date: _____
Completed: _____

Resolution (confirm effectiveness of implemented solutions):

Responsible Person: _____
Signature and Date: _____

****EXAMPLE****

Corrective and Preventive Action for Compliance Form

Noncompliance or Potential Noncompliance

Problem Identified: May 25, 2001 Estim. Resolution Due Date: May 30, 2001
Problem Identified By: Rick Ra, Hazardous Waste Management Staff

Problem (describe existing or anticipated problem) Requires Corrective Action:

Four of 17 drums of hazardous waste stored in storage area B behind the Engineering Building were improperly labeled; one had no waste accumulation start date, two had no waste description, and one had no label.

Most Likely Cause(s):

- New employee in Engineering Building started at the beginning of May and didn't receive training during first week of work
- Laboratory where new employee works didn't receive phone number for waste management department to receive support in handling and storing waste.
- Supply of labels was low and existing label were old and ineffective

Possible Solution(s):

- Schedule and complete training for new employee.
- Meet with all laboratory managers in Engineering Building to review hazardous waste management procedures.
- Provide new supply of labels and phone number magnets

Implemented Solution(s):

Due Date: <u>May 30</u>	(1) Trained new employee May 28
Completed: <u>May 30</u>	(2) Conducted meeting with laboratory managers May 28
	(3) Resupplied labels and magnets May 30

Resolution (confirm effectiveness of implemented solutions): Engineering Building staff has been trained/briefed on hazardous waste handling procedures and no further deficiencies have been noted for 3 months. (dated September 1, 2001)

Responsible Person: Suzie Thompson, C/U Environmental Manager
Signature and Date: _____

RECORDS

Records management should enable you to prove that your C/U is actually implementing the EMS as designed. Records management is often viewed as bureaucratic, but it is hard to imagine a process or system operating consistently without keeping accurate records. Good records will primarily benefit the C/U team while they develop, implement, review, and revise the EMS. Occasionally it may be necessary to prove the effectiveness of the EMS to people outside the C/U including community organizations, environmental groups, or a “registrar” that has been asked to certify the EMS as conformant to an environmental standard such as ISO 14000/14001.

Tips for Implementing a Manageable and Complete Records System:

- Focus on records that add value – avoid bureaucracy. If records have no value, do not keep them. Make the records that you do keep accurate and complete.
- Use a computer to maintain records and documents; make records available to employees via a designated computer or via a campus network.
- Consider the need for security. Should access to some records be limited? Should duplicates of some records be maintained elsewhere?
- Establish a records retention policy considering relevant regulatory requirements and stick with it.

sized Organizations, NSF International, 2001

Implementation:

Basic records management is straightforward—*Procedure 4.4, Records*, gives examples of what records you should keep, how they are kept and for how long, and how to dispose of records that are no longer needed.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	4.4
	Effective Date	
	Subject	Records

Purpose This procedure is used to maintain EMS records.

Step 1 The EMS Manager and other personnel selected by the EMS Manager are responsible for identifying records that are maintained by the campus as part of the EMS.

Step 2 The EMS Manager and other personnel will maintain a document index of

- all data required,
- persons responsible,
- location and
- length of retention.

Step 3 The EMS Manager and other facility personnel will identify and note on the document index any restrictions on records necessary for security.

Step 4 The EMS Manager and other facility personnel will review the records and purge obsolete records at least every (Insert time frequency appropriate for your [C/U Name] and circumstances).

Types of Records You Might Maintain (Examples):

- Legal, regulatory, and other code requirements
- Results of environmental aspects identification
- Reports of progress toward meeting objectives and targets
- Permits, licenses, and other approvals
- Job descriptions and performance evaluations
- Training records
- EMS audit and regulatory compliance audit reports
- Reports of identified nonconformities, corrective action plans, and corrective action tracking data
- Hazardous material spill / other incident reports
- Communications with customers, suppliers, contractors, and other external parties
- Results of management reviews
- Sampling and monitoring data
- Maintenance records
- Equipment calibration records

Responsible Person: _____

Signature and Date: _____

EMS AUDITS

After the EMS has been established, verifying the implementation of the system will be critical. To identify and resolve EMS deficiencies the EMS Team must actively seek them out.

In smaller C/Us, EMS audits are particularly relevant since managers are often so close to the work that they may not see problems or bad habits that have developed; in larger C/Us, managers may develop too much distance to operations and conditions within the C/U making EMS audits similarly important. Periodic EMS audits will establish whether or not all requirements of the EMS are being carried out in the appropriate manner.

For your EMS audit program to be effective, you should:

1. Develop audit procedures and protocols
2. Establish an appropriate audit frequency
3. Train your auditors
4. Maintain audit records

To get started, consider the following questions:

- ♦ How frequently do we need to audit?

As a rule of thumb, all parts of the EMS should be audited at least annually. You can audit the entire EMS at one time or break it down into discrete elements for more frequent audits.

- ♦ Who will perform the audits?

You will need trained EMS auditors. Auditor training should be both initial and ongoing. Commercial EMS auditor training is available, but it might be more cost-effective to utilize students and faculty as part of a planned curriculum to obtain trained auditors.

EMS auditors should be trained in auditing techniques and management system concepts. To obtain a list of ANSI-RAB EMS/ISO 14000 Registrars, see http://www.rabnet.com/er_dir.htm. In addition, knowledge of environmental regulations, facility operations, and environmental science is desirable, and in

Audit procedure should describe:

- Audit scope (areas and activities covered)
- Audit frequency
- Audit methods
- Key responsibilities
- Reporting mechanisms

And when implemented, should result in:

- Continuous improvement
- Consistent EMS performance
- Avoiding or minimizing surprises anticipating problems

Options for C/U EMSs Auditors

- Consultants: Hire EMS experts to develop and perform audits or train C/U staff on auditing techniques
- Faculty and Students: C/Us have access to professors, graduate, and undergraduate students who can serve as an excellent audit team. Whether trained and directed by outside consultants or professors, make sure your expectations of the audit team are met and consider paying your auditors
- Other C/Us: Exchange services as an auditor with another C/U; colleagues from C/Us will likely best understand your C/U's organization and operational challenges and can serve as a good comparative case study.

some cases may be essential to adequately assess the EMS. Some auditor training can be obtained on the job. The C/U's first few EMS audits can be considered part of an auditor training program, but make sure that an experienced auditor or faculty takes part in those "training" audits. Training and including faculty and staff in auditing can have benefits to the audit process due to participants' knowledge of the organization, and can be an educational experience. Keep in mind, however, that when members of an organization participate in audits, good audit practice requires that auditors should be independent of the area/process they are auditing. Auditors should swap departments for purposes of the audit and should not audit their own department or work.

- ♦ How should audit results be used?

EMS audit results can be used to identify trends or patterns in EMS deficiencies. The C/U must also make sure that any identified system gaps or deficiencies are corrected in a timely fashion, and that the corrective actions are documented.

Hints:

- ♦ Your EMS audits should focus on objective evidence of conformance (if you cannot tell whether or not a particular procedure has been followed, then you should consider revising the procedure). During the actual audit, auditors should resist the temptation to evaluate why a procedure was not followed that step comes later.
- ♦ During the audit, auditors should discuss identified deficiencies with the people who work in the area; this will help the auditors verify and validate their evaluations.
- ♦ If possible, train at least two people as internal auditors so they can work as a team comparing opinions, sharing strengths, and bringing expertise to the audit.
- ♦ Before you start an audit, be sure to explain the audit scope, schedule, and other pertinent information to the people in the affected area to help avoid confusion and to foster trust and ultimately result in a better audit.
- ♦ Consider linking your EMS audit program to your regulatory compliance audit process. But keep in mind that these audit programs have different purposes, and while you might want to communicate the results of EMS audits widely within your C/U, the results of compliance audits might need to be communicated in a more limited fashion.

Sources of Evidence

- Interviews
- Document review
- Observation of work practices

Procedure 4.5, Self-Audits, describes in general the various steps of a self-audit at your C/U. The procedure may be implemented in part with the aid of an EMS Audit checklist, such as the C2E2 EMS Scorecard form in the Introduction to this Manual and the EMS Audit Findings Form provided below. Starting with each of the C/U's EMS procedures, review how the EMS has been implemented:

- ✓ Are EMS procedures clearly written and include who repeated, and what documentation will be created?
- ✓ What record demonstrates that the procedures have been followed?
- ✓ Have EMS procedures been effective?
- ✓ What improvements have been identified and implemented?

An unsatisfactory answer to these or other questions could indicate an "EMS Nonconformance."

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	4.5
	Effective Date	
	Subject	Self Audits

Purpose This procedure is used to define the process for scheduling, conducting, and reporting periodic, internal audits of the EMS. Internal audits help to ensure the proper implementation and maintenance of the EMS by verifying that activities conform to documented procedures and that corrective actions are undertaken and are effective.

Step 1 One or more auditors will be selected to form the audit team. If the team consists of more than one auditor, a Lead Auditor will be designated. The Lead Auditor will be responsible for audit team orientation, coordinating the audit process, and coordinating preparation of the audit report.

Step 2 The Lead Auditor will ensure that the team is adequately prepared to initiate the audit. Pertinent policies, procedures, standards, regulatory requirements and prior audit reports will be made available for review by the audit team. Each auditor will have appropriate audit training consisting of _____ (complete as appropriate for your {C/U name}).

It is important to note that the auditor(s) should be independent of the activities they audit, objective and free from bias to ensure the objectivity of the audit process and the findings.

Step 3 The Lead Auditor is responsible for ensuring the preparation of a written plan for the audit. The EMS Audit Checklist may be used as a guide for this plan.

Step 4 The plant areas and people to be audited will be notified a reasonable time prior to the audit.

Step 5 Conducting the Audit

1. A pre-audit conference will be held with appropriate personnel to review the scope, plan and schedule for the audit.
2. Auditors are at liberty to modify the audit scope and plan if conditions warrant.
3. Objective evidence will be examined to verify conformance to EMS requirements. Objective evidence can include information gathered through interviews, visual observation, or review of documentation such as operating procedures. All findings must be documented.

4. Specific attention will be given to corrective actions for audit findings from previous audits.
5. A post-audit conference will be held to present audit findings, clarify any misunderstandings, and summarize the audit results.

Step 6 The Lead Auditor will prepare the audit report, which summarizes the audit scope, identifies the audit team, describes sources of evidence used, and summarizes the audit results.

Findings requiring corrective action will be entered into the corrective action database.

Step 7 The EMS Manager is responsible for communicating the audit results to responsible area and/or functional management.

Step 8 Staff in the affected areas and/or functions are responsible for any follow-up actions needed as a result of the audit.

Step 9 Audit reports will be retained for at least 2 years from the date of audit completion.

Responsible Person: _____

Signature and Date: _____

EMS Findings Form

Instructions: An auditor can use this form to document EMS nonconformances or positive practices discovered during audits and describe corrective or preventive actions required.

Type of Finding (circle one):		Date: _____
Nonconformance: Major Minor Positive Practice Recommendation		
Description (specify location/department/activity and nature of problem):		

Auditor: _____	Auditee's Rep.: _____	
Corrective Action Plan (including time frames):		

Preventive Action		

Individual Responsible for Completion of the Corrective Preventive Action:	Date Corrective Preventive Action Completed:	
_____	_____	
Corrective Preventive Action Verified By:		
_____		Date: _____

Source: Adapted from **Environmental Management Systems: An Implementation Guide For Small And Medium-Sized Organizations**, NSF International, 2001

EMS Findings Form

EXAMPLES

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ADMINISTRATION REVIEW

Administration reviews are the key to continual improvement and to ensuring that the EMS will continue to meet the C/U's needs over time. In fact, administration review can be viewed as much as an opportunity to promote the value and effectiveness of the EMS as well as to receive constructive feedback.

What is an Administration Review?

An Administrative Review is *"a periodic meeting held between C/U administration and EMS personnel to discuss the status of the C/Us EMS."*

Administration reviews are also a good opportunity to keep your EMS efficient and cost effective. For example, some organizations have found that certain procedures and processes initially put in place were not needed to achieve their environmental objectives or control key processes. If EMS procedures and other activities don't add value, eliminate them.

The key questions that a administration review seeks to answer are: "Is the system working?" and "Is the EMS suitable, adequate, and effective, given our

Hints:

- ♦ Two kinds of people should be involved in the administration review process:
 - people who have the right information and knowledge (i.e., EMS Manager, Team members)
 - people who can make decisions (i.e., Chancellor, Provost)
- ♦ Determine the frequency for administration reviews that will work best for the C/U. Some C/Us combine these reviews with other meetings (such as administration meetings), while other hold "stand-alone" reviews
- ♦ Make sure that someone takes notes on what issues were discussed, what decisions were arrived at, and what action items were selected. Administration reviews should be documented.
- ♦ The administration review should assess how changing circumstances might influence the suitability, effectiveness, or adequacy of your EMS. Changing circumstances may be internal to your organization (for example, new facilities or new materials, changes in C/U administration or budgets), or may be external factors (such as new laws, new scientific information, new enforcement initiative, or changes in adjacent land use).

Have we:

- ✓ Established a process for periodic reviews of our EMS?
- ✓ Documented the results of such reviews?
- ✓ Followed up on action items to ensure closure?

- ♦ Once you have documented the action items arising from your administration review, be sure to follow up. Progress on these action items should be tracked.
- ♦ As you evaluate potential changes to your EMS, consider other organizational plans and goals. Environmental decision-making should be integrated into your overall management strategy.

Questions to Ponder During Administration Reviews

- ✓ Did we achieve our objectives and targets? (If not, why not?) Should we modify our objectives? Should we set new objectives and targets?
- ✓ Is our environmental policy still relevant and current?
- ✓ Are roles and responsibilities clear and do they make sense?
- ✓ Are we applying resources appropriately?
- ✓ Are the procedures clear and adequate? Do we need others? Should we eliminate some?
- ✓ Are we monitoring our EMS (e.g., via system audits)?
- ✓ What effects have changes in procedures, facilities, and materials had on our EMS and its effectiveness?
- ✓ Do changes in laws or regulations require us to change some of our approaches?
- ✓ What stakeholder concerns have been raised since our last review?
- ✓ Is there a better way?
- ✓ What else can we do to improve?
- ✓ If our current EMS looked at certain departments, should we expand our EMS to other departments or campus-wide?
- ✓ Is a new aspects or impacts analysis needed?

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	4.6
	Effective Date	
	Subject	Administration Review

Purpose The purpose of this procedure is to document the process and primary agenda of issues to be included in the Administration Review meetings for evaluating the organization's EMS. The Administration Review process is intended to provide a forum for discussion and improvement of the EMS and to provide management with a vehicle for making any changes to the EMS necessary to achieve the organization's goals.

Step 1 The EMS Manager is responsible for scheduling and conducting a minimum of two Administration Review meetings during each 12-month period. The EMS Manager is also responsible for ensuring that the necessary data and other information are collected prior to the meeting.

Step 2 At a minimum, each Administration Review meeting will consider the following:

- ♦ the suitability, adequacy and effectiveness of the environmental policy
- ♦ the suitability, adequacy and effectiveness of the environmental objectives (as well as the organization's current status against these objectives)
- ♦ the overall suitability, adequacy and effectiveness of the EMS
- ♦ the status of corrective and preventive actions and the results of any EMS audit conducted since the last Administration Review meeting
- ♦ the suitability, adequacy and effectiveness of training efforts
- ♦ the results of any action items from the previous Administration Review meeting

Step 3 Minutes will be taken of the Administration Review. These meeting minutes will include, at a minimum, a list of attendees, a summary of key issues discussed, and any action items arising from the meeting.

Step 4 A copy of the meeting minutes will be distributed to attendees and any individuals assigned action items. A copy of the meeting minutes will be retained on file.


APPENDIX A

EMS RESOURCES



Here is a list of resources that will help you analyze your C/U's environmental aspects and impacts. The following links outline different methods to complete an aspects review:

- ❖ Campus Consortium for Environmental Excellence (C2E2) EMS Self-Assessment Checklist, 2000 <http://esf.uvm.edu/c2e2>
- ❖ Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations, Second Edition, NSF International, 2001 (www.nsf-isr.org/publications/iso_14000.html)
- ❖ Integrated Environmental Management Systems: Implementation Guide, EPA 744-R-00-011, 2000 (www.epa.gov/opptintr/dfe/tools/ems/ems.html)
- ❖ Kentucky Pollution Prevention Center EMS Alliance. Offering assistance to C/U members on developing and implementing an ISO14001 aligned EMS. (<http://www.kppc.org/ems/index.cfm>)
- ❖ U.S. EPA New England (Region I) Colleges and Universities Home Page (<http://www.epa.gov/region01/steward/univ/index.html>)
- ❖ University of Massachusetts Lowell EMS Service Program; contact Mathew_Donahue@uml.edu

Additionally, the tools listed below will help you analyze your aspects, by assisting with the calculations of some difficult-to-measure aspects:

AIR AND ENERGY RESOURCES	
	Calculate Your Savings Using an Energy Star Product <ul style="list-style-type: none"> ✓ Calculates savings using Energy Star products, including boilers, air conditioners, commercial clothes washers, computers and monitors, copiers, and much, much more. http://www.energystar.gov/save.shtml
	Default Calculations for Emission Factors, Energy Prices, etc. <ul style="list-style-type: none"> ✓ Provides several useful conversion rates often needed for calculating environmental impacts http://www.epa.gov/nrgystar/purchasing/calculators/defvalue.html

AIR AND ENERGY RESOURCES (CONTINUED)

	<p>Energy Star for Business – Interactive Tools, Software, Calculators</p> <ul style="list-style-type: none"> ✓ Links to online resources such as ProjectKale, which provides a full analysis on potential lighting upgrades, and QuickChill, EPA's latest software tool for assessing centrifugal chiller upgrades. <p>http://yosemite1.epa.gov/estar/business.nsf/webmenus/bins?OpenDocument&pca=Business&type=tools</p>
	<p>Waste Reduction Model (WARM) for Calculating Emissions</p> <ul style="list-style-type: none"> ✓ WARM model helps solid waste planners and organizations track and voluntarily report greenhouse gas emissions reductions from several different waste management practices. <p>http://www.epa.gov/oppeoee1/globalwarming/actions/waste/warm.htm</p>
	<p>The Cleaner and Greener Program's Pollution Calculator</p> <ul style="list-style-type: none"> ✓ "Pollution from Electricity Use Calculator" estimates how much pollution is generated based on your annual energy use. ✓ "Emission Reduction Calculator" estimates how much money you can save and the pollution you can reduce by investing in energy efficiency in residences or workplaces. <p>http://www.cleanerandgreener.org/pollution-from-electricity.htm</p>
<h3>LABORATORY RESOURCES</h3>	
	<p>EPA's Environmental Management Guide for Small Laboratories</p> <ul style="list-style-type: none"> ✓ Download a copy of EPA's "Environmental Management for Small Laboratories" that addresses all aspects of laboratory management. <p>http://www.epa.gov/ormisbo1/labguide.htm</p>
	<p>EPA's Green Chemistry Program</p> <ul style="list-style-type: none"> ✓ Promotes innovative chemical technologies that reduce or eliminate the use or generation of hazardous substances in the design, manufacture, and use of chemical products. <p>http://www.epa.gov/opptintr/greenchemistry/</p>

LABORATORY RESOURCES (CONTINUED)

National Microscale Chemistry Center

National Microscale Chemistry Center

- ✓ Promotes the use of microscale chemistry as a means of eliminating toxic waste at the source. Offers workshops, seminars, and publications on the operation and advantages of conversion of laboratories to the microscale level.

<http://www.silvertech.com/microscale/>

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APPENDIX B

GLOSSARY

Administration Review. A periodic review held between C/U Administration and EMS personnel to discuss the effectiveness and continual improvement of the C/U EMS.

Baseline Environmental Conditions. Environmental conditions at the facility before EMS implementation.

Commitment to Compliance. The organization's commitment to achieving and or maintaining regulatory compliance. This commitment is reflected in documented practices and procedures that ensure that regulatory compliance is a top priority of the organization and the EMS. Examples include systematic and documented procedures for periodic regulatory compliance audits and for corrective action taken in response to discovered instances of noncompliance.

Compliance Review. A compliance review is a periodic assessment of your C/Us compliance with environmental legal requirements.

Document Control. A system to ensure responsible management of all EMS documents.

Emergency Response and Preparedness Program. A program that plans and prepares for emergencies, such as employee injuries or hazardous chemical spills.

Environmental Aspects. An element of an organization's activities, products, or services that can interact with the environment.

Environmental Impacts. Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services.

Environmental Management System (EMS). A continual cycle of planning, implementing, reviewing and improving the actions that an organization takes to meet its environmental obligations.

EMS Audit. A process of objectively obtaining and evaluating evidence to determine whether an organization's EMS is operating as intended.

EMS Manager. C/U employee charged with initiating and leading EMS implementation.

EMS Participants. Anyone involved with implementation of EMS elements, including aspect and impact or compliance review, achieving objectives and targets, and collecting measurement and monitoring data.

EMS Nonconformance and Corrective Action. A corrective action taken to address and rectify a deficiency or nonconformance with the EMS.

EMS Steering Group. Small group of EMS Participants and C/U administrators providing (1) guidance via response to EMS briefings and (2) feedback via management review to the EMS Team to ensure progress, effectiveness, and wise use of EMS resources.

EMS Team. Core group of people potentially comprised of C/U staff, faculty, students, departmental leads, and administration responsible for day-to-day EMS activities; often made up primarily of C/U environmental, health, and safety staff.

Environmental Metrics. Measurable parameters that reflect environmental performance trends.

Environmental Performance. The measurable results of the environmental management system, related to an organization's control of its environmental aspects, based on environmental policy, objectives and targets.

Environmental Policy. Statement of a C/Us intentions and principles in relation to its overall environmental performance, which provides a framework for action and a backup for its environmental objectives and targets.

Gap Analysis or Preliminary Review. A review of an organization's position with regard to the environment done in advance of or at the beginning stages of planning the EMS. The review should cover three key areas: legislative and regulatory requirements, identification of significant environmental aspects, and an examination of all existing environmental management practices.

ISO 14001. A widely accepted, official international standard for environmental management systems.

Noncompliance and Corrective Action/Preventive Action: A corrective (or preventive) action taken to address and rectify (or prevent) a deficiency or noncompliance with environmental standards or regulations.

Objective. A C/Us goal that is consistent with the company's environmental policy, priority environmental aspects, and applicable environmental regulations.

Operational Control. The identification, planning, and management of operations and activities in line with the EMS policy, objectives, and targets.

Pollution Prevention (P2). Prevention of pollution through source reduction and waste minimization techniques and technologies.

Prioritization Criteria. Criteria for prioritizing environmental aspects.

Records. Proof of actions taken that were outlined in the EMS.

Target. A detailed performance requirement related to and supporting a specific objective. Such targets feature measurable parameters and timelines for attainment.